(1)

Access DB# 200512

SEARCH REQUEST FORM

Scientific and Technical Information Center

Requester's Full Name: Sin J. Lee Examiner #: 76060 Date: 9-6-06
Art Unit: 1752 Phone Number 30 2-7333 Serial Number: 10/646,307
Mail Box and Bldg/Room Location: 9C15 (Rem) Results Format Preferred (circle): PAPER DISK E-MAIL

If more than one search is submitted, please prioritize searches in order of need.

****

Please provide a detailed statement of the search topic, and describe as specifically as possible the subject matter to be searched. Include the elected species or structures, keywords, synonyms, acronyms, and registry numbers, and combine with the concept or utility of the invention. Define any terms that may have a special meaning. Give examples or relevant citations, authors, etc, if known. Please attach a copy of the cover sheet, pertinent claims, and abstract.

SCIENTIFIC REFERENCE BR
Sci & Tech Inf. Ctr.
SEP
Pat. & T.M. Office

Title of Invention: Plz. Ale Bib.

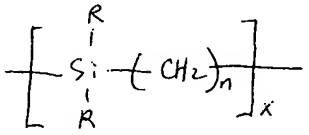
Inventors (please provide full names): _____

Earliest Priority Filing Date: _____

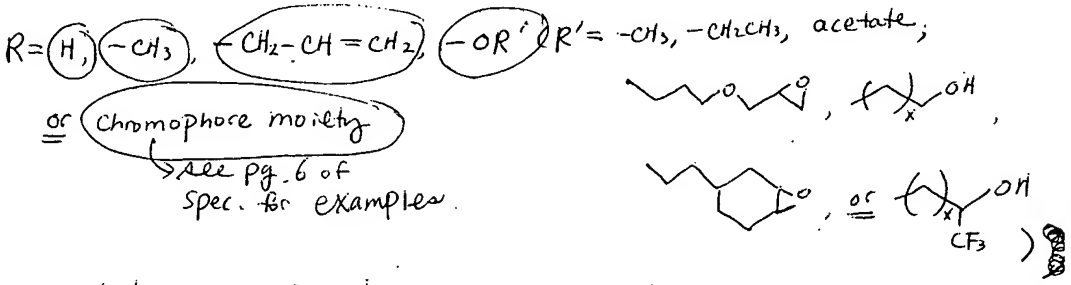
**For Sequence Searches Only* Please include all pertinent information (parent, child, divisional, or issued patent numbers) along with the appropriate serial number.*

Plz. search for a compositon that contains

(1) polycarbosilane of general formula



(n≥1, X≥1)



(2) crosslinking component
(See Cl. #1 for examples)

****

STAFF USE ONLY	Type of Search		Vendors and cost where applicable	
Searcher:	NA Sequence (#)		STN	
Searcher Phone #:	AA Sequence (#)		Dialog	
Searcher Location:	Structure (#)	4	Questel/Orbit	
Date Searcher Picked Up:	Bibliographic		Dr.Link	
Date Completed: 9/11/06	Litigation		Lexis/Nexis	
Searcher Prep & Review Time: 30	Fulltext		Sequence Systems	
Clerical Prep Time:	Patent Family		WWW/Internet	
Online Time: 292	Other		Other (specify)	

PTO-1590 (8-01)

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Bib Data Sheet

CONFIRMATION NO. 9204

SERIAL NUMBER	FILING DATE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
10/646,307	08/22/2003 RULE	430	1752	YOR920020289US1

APPLICANTS

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Dirk Pfeiffer, Dobbs Ferry, NY;
Karen Temple, Croton-on-Hudson, NY;

** CONTINUING DATA **********
None SJL

** FOREIGN APPLICATIONS **********
None SJL

IF REQUIRED, FOREIGN FILING LICENSE GRANTED
** 11/13/2003

		STATE OR	SHEETS	TOTAL	INDEPENDENT
Foreign Priority claimed	☐ yes ☑ no	COUNTRY	DRAWING	CLAIMS	CLAIMS
35 USC 119 (a-d) conditions met	☐ yes ☐ no ☐ Met after Allowance	NY	1	34	3
Verified and Acknowledged	Examiner's Signature SJL Initials				

ADDRESS
Ryan, Mason & Lewis, LLP
Suite 205
1300 Post Road
Fairfield , CT
06824

TITLE
Antireflective hardmask and uses thereof

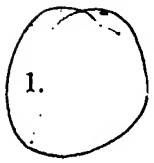
FILING FEE	FEES: Authority has been given in Paper No. _____ to charge/credit DEPOSIT ACCOUNT	☐ All Fees ☐ 1.16 Fees (Filing) ☐ 1.17 Fees (Processing Ext. of time)

Docket No. YOR920030129US1

IN THE CLAIMS:

Please amend the claims as follows:

Please cancel claims 14 and 24-34, without prejudice.



1. (Currently Amended) An antireflective hardmask layer for lithography, comprising:

a carbosilane polymer backbone comprising at least one chromophore moiety and at least one transparent moiety; and

a crosslinking component, wherein the crosslinking component comprises a crosslinking group selected from the group consisting of glycoluril, alcohols, aromatic alcohols, hydroxybenzyl, phenol, hydroxymethylbenzyl, cycloaliphatic alcohols, aliphatic alcohols, cyclohexanoyl, propanol, non-cyclic alcohols, fluorocarbon alcohols, vinyl ethers, epoxides and compositions comprising at least one of the foregoing crosslinking groups.

2. (Original) The antireflective hardmask layer of claim 1, wherein the carbosilane polymer backbone comprises SiO-containing units.

3. (Original) The antireflective hardmask layer of claim 2, wherein the carbosilane polymer backbone comprises more carbosilane than SiO-containing units.

4. (Original) The antireflective hardmask layer of claim 1, further comprising an additional crosslinking component.

5. (Original) The antireflective hardmask layer of claim 1, wherein the carbosilane polymer backbone comprises unsaturated carbon to carbon bonds.

The composition may comprise from about 50 weight percent (wt.%) to about 98 wt.%, on a solids basis, polymer. For example, the composition may comprise from about 70 wt.% to about 80 wt.% polymer.

As mentioned above, each R group can be either a chromophore moiety, a transparent moiety, or a crosslinking component. The carbosilane polymer backbone itself is generally transparent to most wavelengths employed. However, the introduction of fluorine-containing moieties or SiO-containing units, which are substantially transparent to the imaging radiation, may be desirable. In some instances, multiple moieties and/or crosslinking components may be present on the same carbosilane or SiO-containing unit. For example, a crosslinking component and a chromophore moiety may be present on the same carbosilane unit.

The chromophore moiety may comprise any suitable chromophore moiety which can be grafted onto the carbosilane or SiO-containing units with suitable radiation absorption characteristics and does not adversely affect the performance of either the antireflective hardmask composition, or any overlying radiation-sensitive layers. Suitable chromophore moieties include, but are not limited to, phenyl, chrysenes, pyrenes, fluoranthrenes, anthrones, benzophenones, thioxanthones, and anthracenes. Anthracene derivatives, for example those described in Renner, U.S. Patent 4,371,605 "Photopolymerizable Compositions Containing N-hydroxyamide and N-hydroxyimide Sulfonates," the disclosure of which is incorporated by reference herein, may also be used (e.g., 9-Anthracene methanol is a preferred chromophore for 248 nanometer (nm) lithography). The chromophore moiety preferably does not contain nitrogen, except for possibly deactivated amino nitrogen such as in phenol thiazine. For 193 nm lithography, non-aromatic compounds containing unsaturated carbon bonds, e.g., carbon to carbon double bonds, are also suitable chromophores. Highly crosslinked carbosilanes can have suitable optical properties at 193 nm without the addition of a chromophore. For 157 nm

STIC Search Results Feedback Form

EIC17000

Questions about the scope or the results of the search? Contact ***the EIC searcher or contact:***

Kathleen Fuller, EIC 1700 Team Leader
571/272-2505 REMSEN 4B28

Voluntary Results Feedback Form

- *I am an examiner in Workgroup:* ☐ *Example: 1713*
- *Relevant prior art* ***found****, search results used as follows:*
  - ☐ 102 rejection
  - ☐ 103 rejection
  - ☐ Cited as being of interest.
  - ☐ Helped examiner better understand the invention.
  - ☐ Helped examiner better understand the state of the art in their technology.

Types of relevant prior art found:

- ☐ Foreign Patent(s)
- ☐ Non-Patent Literature
  (journal articles, conference proceedings, new product announcements etc.)

- *Relevant prior art* ***not found:***
  - ☐ Results verified the lack of relevant prior art (helped determine patentability).
  - ☐ Results were not useful in determining patentability or understanding the invention.

Comments:

Drop off or send completed forms to EIC1700 REMSEN 4B28

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=> d his full

     (FILE 'HOME' ENTERED AT 12:47:12 ON 11 SEP 2006)

     FILE 'HCAPLUS' ENTERED AT 12:47:22 ON 11 SEP 2006
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                 SEL RN

     FILE 'REGISTRY' ENTERED AT 12:48:17 ON 11 SEP 2006
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                 1628-01-9/BI OR 2530-83-8/BI OR 2996-92-1/BI OR 62306-27-
                 8/BI OR 845815-80-7/BI OR 845815-81-8/BI OR 845815-82-9/B
                 I OR 845815-83-0/BI)

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L4                 STRUCTURE
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L6            50 SEA SSS SAM L4 AND L5
L7         66289 SEA SSS FUL L4 AND L5
                 SAV L7 LEE307/A
L8                 STRUCTURE
L9            50 SEA SUB=L7 SSS SAM L8
L10                STRUCTURE
L11           38 SEA SUB=L7 CSS SAM L10
L12         1244 SEA SUB=L7 CSS FUL L10
                 SAV L12 LEE307A/A
L13                STRUCTURE
L14           48 SEA SSS SAM L13 AND L5
L15          955 SEA SSS FUL L13 AND L5
                 SAV L15 LEE307B/A
L16                STRUCTURE
L17           21 SEA SUB=L15 SSS SAM L16
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                 SAV L18 L33307C/A
L19                SCR 2068
L20           50 SEA SUB=L7 SSS SAM L19
L21        21032 SEA SUB=L7 SSS FUL L19
                 SAV L21 L3307D/A


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L23         1569 SEA ABB=ON  PLU=ON  L12
L24          413 SEA ABB=ON  PLU=ON  L18
L25        36212 SEA ABB=ON  PLU=ON  L21
L26          502 SEA ABB=ON  PLU=ON  (L22 OR L23 OR L24 OR L25) AND
                 ?REFLECTIV?
L27           40 SEA ABB=ON  PLU=ON  L26 AND (?LITHO? OR PHOTOMASK? OR
                 MASK?)
L28            8 SEA ABB=ON  PLU=ON  L27 AND (CROSSLINK? OR CROSS? (2A)
                 LINK?)
L29           32 SEA ABB=ON  PLU=ON  L27 NOT L28
L30           24 SEA ABB=ON  PLU=ON  L29 AND (1840-2003)/PRY,PY,AY
L31            8 SEA ABB=ON  PLU=ON  L28 AND (1840-2003)/PRY,PY,AY


=> file reg
FILE 'REGISTRY' ENTERED AT 16:17:05 ON 11 SEP 2006
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                 /BI OR 62306-27-8/BI OR 845815-80-7/BI OR 845815-81-8/BI
                 OR 845815-82-9/BI OR 845815-83-0/BI)
L4               STR

Si—CH2
1   2

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DEFAULT ECLEVEL IS LIMITED

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NUMBER OF NODES IS   2

STEREO ATTRIBUTES: NONE
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  ≀           @5  6                  @8   9   10
  ≀
1 Si—C
  ≀   2
  ≀
 G1
  4

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GGCAT   IS UNS  AT  11
DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:
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NUMBER OF NODES IS  11

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Si⊘CH2
1   2

NODE ATTRIBUTES:
DEFAULT MLEVEL IS ATOM
DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:
RING(S) ARE ISOLATED OR EMBEDDED
NUMBER OF NODES IS   2

STEREO ATTRIBUTES: NONE
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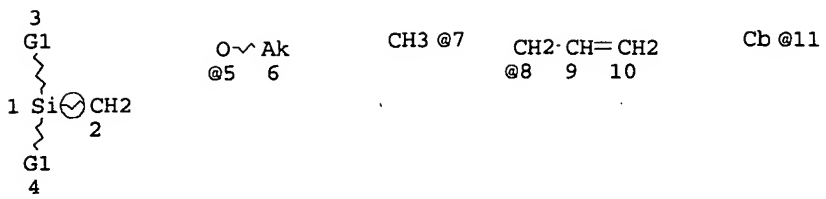

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GGCAT IS UNS AT 11
DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:
RING(S) ARE ISOLATED OR EMBEDDED
NUMBER OF NODES IS 11

STEREO ATTRIBUTES: NONE

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L23	1569	SEA FILE=HCAPLUS ABB=ON PLU=ON L12
L24	413	SEA FILE=HCAPLUS ABB=ON PLU=ON L18
L25	36212	SEA FILE=HCAPLUS ABB=ON PLU=ON L21
L26	502	SEA FILE=HCAPLUS ABB=ON PLU=ON (L22 OR L23 OR L24 OR L25) AND ?REFLECTIV?
L27	40	SEA FILE=HCAPLUS ABB=ON PLU=ON L26 AND (?LITHO? OR PHOTOMASK? OR MASK?)
L28	8	SEA FILE=HCAPLUS ABB=ON PLU=ON L27 AND (CROSSLINK? OR CROSS? (2A) LINK?)
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=> file hcaplus
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=> d l31 1-8 ibib abs hitstr hitind

L31 ANSWER 1 OF 8 HCAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 2005:472204 HCAPLUS
DOCUMENT NUMBER: 143:35205
TITLE: **Antireflective** coatings for via fill and **photolithography** applications and methods of preparation thereof
INVENTOR(S): Li, Bo; Kennedy, Joseph; Iwamoto, Nancy; Lu, Victor; Leung, Roger; Fradkin, Mark A.; Hussein, Makarem A.; Goodner, Michael D.
PATENT ASSIGNEE(S): Honeywell International Inc., USA
SOURCE: PCT Int. Appl., 120 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2005049681	A2	20050602	WO 2004-US38517	200411 17
			<--	
WO 2005049681	A3	20060420		
W:	AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW			
RW:	BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG			
US 2005171277	A1	20050804	US 2003-717028	200311 18
			<--	
EP 1695142	A2	20060830	EP 2004-811280	200411 17
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R:	AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, PL, SK, HR, IS, YU			
PRIORITY APPLN. INFO.:			US 2003-717028 A	200311 18
			<--	
			WO 2004-US38517 W	200411 17

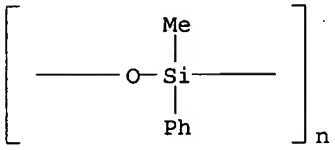
AB An antireflection coating that contains an optical absorber which absorbs strongly and uniformly in the UV regions, keeps the photoresist from falling over and expanding outside or inside the resist region, is imperious to developers and methods of prodn. of SOG **antireflective** coatings, satisfies goals of etching or stripping selectivity, minimizes filling bias and voiding in vias, forms stable solns. with good shelf life, is compatible with ArF **photolithog.**, is applicable using any coating method, is capable of via fill and planarization, has good etching rates, and can be used in any semiconductor device fabrication process. An absorbing compn. is described herein that includes at least one inorg.-based compd., at least one absorbing compd., and at least one material modification agent. Methods of making an absorbing compn. are also described that includes: (a) combining at least one inorg.-based compd., at least one absorbing compd., at least one material modification agent, an acid/H2O mixt., and one or more solvents to form a reaction mixt.; and (b) allowing the reaction mixt. to form the absorbing compn. at room temp. Another method of making an absorbing compn. includes: (a) combining at least one inorg.-based compd., at least one absorbing compd., at least one material modification agent, an acid/H2O mixt., and one or more solvents to form a reaction mixt.; and (b) heating the reaction mixt. to form the absorbing compn. Yet another method of making an absorbing compn. is described that includes: (a) combining at least one inorg.-based compd., at least one absorbing compd., at least one material modification agent, and one or more solvents to form a reaction mixt., wherein the at least one material modification agent

comprises at least one acid and H2O; and (b) heating the reaction mixt. to form an absorbing material, a coating or a film. In other methods of making an absorbing compn. described herein, those methods include: (a) combining at least one inorg.-based compd., at least one absorbing compd., at least one material modification agent, and one or more solvents to form a reaction mixt., wherein the at least one material modification agent comprises at least one acid and H2O; and (b) allowing the reaction mixt. to form an absorbing material, a coating or a film.

IT **9005-12-3**, Methylphenylsiloxane
RL: TEM (Technical or engineered material use); USES (Uses)
(**antireflective** coatings for via fill and **photolithog.** applications and methods of prepn. for device fabrication)

RN 9005-12-3 HCAPLUS

CN Poly[oxy(methylphenylsilylene)] (8CI, 9CI) (CA INDEX NAME)



IC ICM C08G

CC 74-13 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)
Section cross-reference(s): 76

ST **antireflective** coating **photolithog** optical absorber coating device fabrication

IT Silsesquioxanes
RL: TEM (Technical or engineered material use); USES (Uses)
(Me Ph; **antireflective** coatings for via fill and **photolithog.** applications and methods of prepn. for device fabrication)

IT Polysiloxanes, uses
Silsesquioxanes
RL: TEM (Technical or engineered material use); USES (Uses)
(Me; **antireflective** coatings for via fill and **photolithog.** applications and methods of prepn. for device fabrication)

IT Polysiloxanes, uses
Silsesquioxanes
RL: TEM (Technical or engineered material use); USES (Uses)
(Ph; **antireflective** coatings for via fill and **photolithog.** applications and methods of prepn. for device fabrication)

IT Optical films
(absorbing; **antireflective** coatings for via fill and **photolithog.** applications and methods of prepn. for device fabrication)

IT Polysilanes
RL: TEM (Technical or engineered material use); USES (Uses)
(acrylic; **antireflective** coatings for via fill and **photolithog.** applications and methods of prepn. for device fabrication)

IT Amines, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(adhesion promoter; **antireflective** coatings for via fill and **photolithog.** applications and methods of prepn. for device fabrication)

IT Densification
(agents; **antireflective** coatings for via fill and **photolithog.** applications and methods of prepn. for

device fabrication)
IT Silanes
RL: TEM (Technical or engineered material use); USES (Uses)
(alkoxy; **antireflective** coatings for via fill and **photolithog.** applications and methods of prepn. for device fabrication)
IT Adhesion promoters
Antireflective films
Catalysts
Crosslinking agents
Optical filters
Photolithography
Porogens
Semiconductor device fabrication
Solvents
(**antireflective** coatings for via fill and **photolithog.** applications and methods of prepn. for device fabrication)
IT Acids, processes
RL: PEP (Physical, engineering or chemical process); PYP (Physical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(**antireflective** coatings for via fill and **photolithog.** applications and methods of prepn. for device fabrication)
IT Monomers
Organic compounds, uses
Phenolic resins, uses
Polymers, uses
Polyoxyalkylenes, uses
Polysiloxanes, uses
Silanes
Silazanes
Silicates, uses
Silsesquioxanes
RL: TEM (Technical or engineered material use); USES (Uses)
(**antireflective** coatings for via fill and **photolithog.** applications and methods of prepn. for device fabrication)
IT Siloxanes (nonpolymeric)
Silsesquioxanes
RL: TEM (Technical or engineered material use); USES (Uses)
(hydrido; **antireflective** coatings for via fill and **photolithog.** applications and methods of prepn. for device fabrication)
IT Polysiloxanes, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(hydrogen; **antireflective** coatings for via fill and **photolithog.** applications and methods of prepn. for device fabrication)
IT Polysiloxanes, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(hydroxy, hydroxyhydrido; **antireflective** coatings for via fill and **photolithog.** applications and methods of prepn. for device fabrication)
IT Silanes
RL: TEM (Technical or engineered material use); USES (Uses)
(hydroxy; **antireflective** coatings for via fill and **photolithog.** applications and methods of prepn. for device fabrication)
IT Materials
(inorg.; **antireflective** coatings for via fill and **photolithog.** applications and methods of prepn. for device fabrication)
IT Phenolic resins, uses
RL: TEM (Technical or engineered material use); USES (Uses)

(novolak; **antireflective** coatings for via fill and **photolithog.** applications and methods of prepn. for device fabrication)

IT Materials
(org.; **antireflective** coatings for via fill and **photolithog.** applications and methods of prepn. for device fabrication)

IT Acrylic polymers, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(photoresist; **antireflective** coatings for via fill and **photolithog.** applications and methods of prepn. for device fabrication)

IT Acrylic polymers, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(polysiloxane-; **antireflective** coatings for via fill and **photolithog.** applications and methods of prepn. for device fabrication)

IT Amines, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(salts, adhesion promoter; **antireflective** coatings for via fill and **photolithog.** applications and methods of prepn. for device fabrication)

IT Interconnections, electric
(vias; **antireflective** coatings for via fill and **photolithog.** applications and methods of prepn. for device fabrication)

IT Silanes
RL: TEM (Technical or engineered material use); USES (Uses)
(vinyl; **antireflective** coatings for via fill and **photolithog.** applications and methods of prepn. for device fabrication)

IT Acids, uses
Bases, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(weak; **antireflective** coatings for via fill and **photolithog.** applications and methods of prepn. for device fabrication)

IT 62-53-3, Aniline, uses 110-86-1, Pyridine, uses 505-86-2, Cetyltrimethylammonium hydroxide 1941-24-8, Tetramethylammonium nitrate 2052-49-5, Tetrabutylammonium hydroxide 6484-52-2, Ammonium nitrate, uses 7664-41-7, Ammonia, uses 7723-14-0, Phosphorus, uses 7727-37-9, Nitrogen, uses 22515-76-0, Ammonium methanesulfonate
RL: TEM (Technical or engineered material use); USES (Uses)
(adhesion promoter; **antireflective** coatings for via fill and **photolithog.** applications and methods of prepn. for device fabrication)

IT 71-43-2D, Benzene, reactive derivs. 72-48-0, Alizarin 75-59-2, Tetramethylammonium hydroxide 78-10-4, TEOS 81-64-1, Quinizarin 84-60-6, Anthraflavic acid 633-00-1, Rosolic acid 723-62-6, 9-Anthracenecarboxylic acid 780-69-8, Phenyltriethoxysilane 1343-98-2D, Silicic acid, derivs. 1468-95-7, 9-Anthracenemethanol 7440-21-3D, Silicon, compds. 8064-60-6, C.I. Direct Yellow 59 9003-53-6D, Polystyrene, derivs. **9005-12-3**, Methylphenylsiloxane 10581-12-1, Tetramethylammonium acetate 16722-51-3, Tosylate, uses 25322-68-3, Polyethylene oxide 29355-26-8, Phenylazophenol 37114-85-5, Cetyltrimethylammonium nitrate 37181-39-8, Triflate 38542-94-8, Ammonium triflate 51374-75-5, Cetyltrimethylammonium acetate 79876-59-8, 2-Hydroxy-4-(3-triethoxysilylpropoxy)-diphenyl ketone 313482-99-4 442905-54-6 442905-55-7 639088-18-9 846606-04-0
RL: TEM (Technical or engineered material use); USES (Uses)
(**antireflective** coatings for via fill and **photolithog.** applications and methods of prepn. for device fabrication)

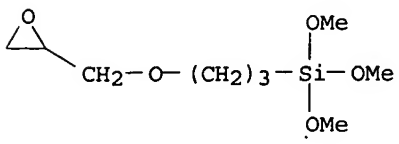
L31 ANSWER 2 OF 8 HCAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 2005:160708 HCAPLUS
DOCUMENT NUMBER: 142:269217
TITLE: **Antireflective** hard **mask** and uses thereof
INVENTOR(S): Babich, Katherina; Huang, Elbert; Mahorowala, Arpan P.; Medeiros, David R.; Pfeiffer, Dirk; Temple, Karen
PATENT ASSIGNEE(S): International Business Machines Corporation, USA
SOURCE: U.S. Pat. Appl. Publ., 12 pp.
CODEN: USXXCO
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 2005042538	A1	20050224	US 2003-646307	20030822
CN 1585097	A	20050223	CN 2004-10049384	20040611
JP 2005070776	A2	20050317	JP 2004-237692	20040817

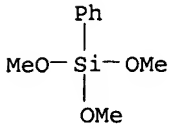
PRIORITY APPLN. INFO.: US 2003-646307 A 20030822

AB **Antireflective** hard **mask** compns. and techniques for the use of **antireflective** hard **mask** compns. for processing of semiconductor devices are provided. In one aspect of the invention, an **antireflective** hard **mask** layer for **lithog.** is provided. The **antireflective** hard **mask** layer comprises a carbosilane polymer backbone comprising at least one chromophore moiety and at least one transparent moiety, and a **crosslinking** component. In another aspect of the invention, a method for processing a semiconductor device is provided. The method comprises the steps of: providing a material layer on a substrate and forming an **antireflective** hard **mask** layer over the material layer.

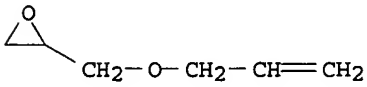
IT **2530-83-8D**, Glycidoxypropyltrimethoxysilane, reaction products with dimethoxypolycarbosilane **2996-92-1D**, Phenyltrimethoxysilane, reaction products with dimethoxypolycarbosilane
RL: NUU (Other use, unclassified); USES (Uses)
(**antireflective** hard **mask** for extreme-UV **photolithog.**)
RN 2530-83-8 HCAPLUS
CN Silane, trimethoxy[3-(oxiranylmethoxy)propyl]- (9CI) (CA INDEX NAME)



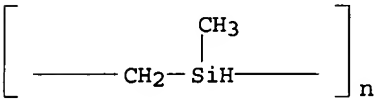
RN 2996-92-1 HCAPLUS
CN Silane, trimethoxyphenyl- (6CI, 7CI, 8CI, 9CI) (CA INDEX NAME)



IT **106-92-3P**, Allyl glycidyl ether **62306-27-8DP**,
Poly[(methylsilylene)(methylene)], reaction product with allyl glycidyl ether **845815-81-8P 845815-82-9P**
845815-83-0P
RL: NUU (Other use, unclassified); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
(**antireflective** hard **mask** for extreme-UV **photolithog.**)
RN 106-92-3 HCAPLUS
CN Oxirane, [(2-propenyloxy)methyl]- (9CI) (CA INDEX NAME)



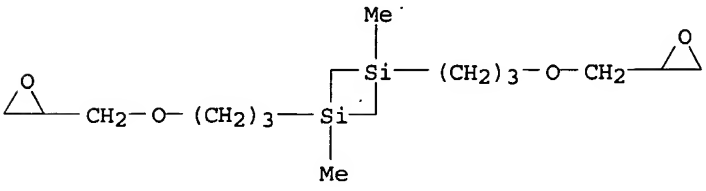
RN 62306-27-8 HCAPLUS
CN Poly[(methylsilylene)(methylene)] (9CI) (CA INDEX NAME)



RN 845815-81-8 HCAPLUS
CN 1,3-Disilacyclobutane, 1,3-dimethyl-1,3-bis[3-(oxiranylmethoxy)propyl]-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 845815-80-7
CMF C16 H32 O4 Si2

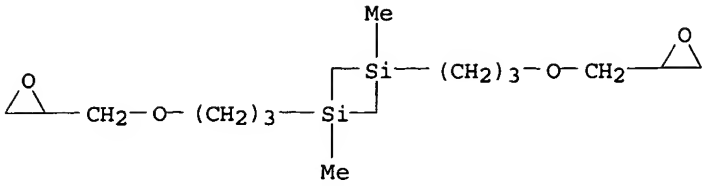


RN 845815-82-9 HCAPLUS
CN 1,3-Disilacyclobutane, 1,3-dimethyl-1,3-bis[3-(oxiranylmethoxy)propyl]-, polymer with 1,1,3,3-tetramethyl-1,3-disilacyclobutane (9CI) (CA INDEX NAME)

CM 1

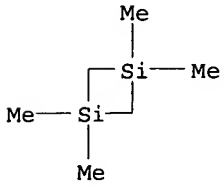
CRN 845815-80-7

CMF C16 H32 O4 Si2

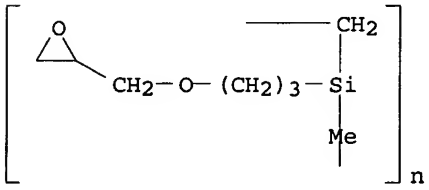


CM 2

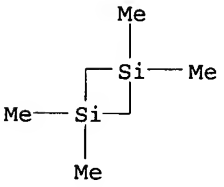
CRN 1627-98-1
CMF C6 H16 Si2



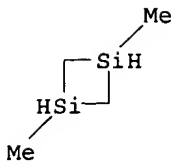
RN 845815-83-0 HCAPLUS
CN Poly[[methyl[3-(oxiranylmethoxy)propyl]silylene]methylene] (9CI) (CA INDEX NAME)



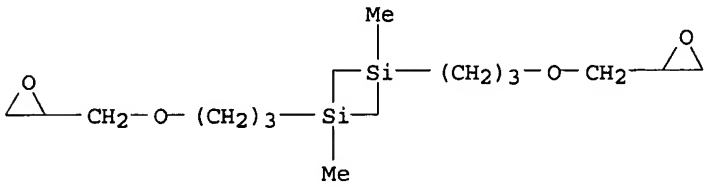
IT **1627-98-1 1628-01-9**
RL: RCT (Reactant); RACT (Reactant or reagent)
(antireflective hard mask for extreme-UV photolithog.)
RN 1627-98-1 HCAPLUS
CN 1,3-Disilacyclobutane, 1,1,3,3-tetramethyl- (6CI, 7CI, 8CI, 9CI) (CA INDEX NAME)



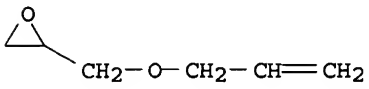
RN 1628-01-9 HCAPLUS
CN 1,3-Disilacyclobutane, 1,3-dimethyl- (7CI, 8CI, 9CI) (CA INDEX NAME)



IT **845815-80-7P**
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)
(**antireflective** hard **mask** for extreme-UV **photolithog.**)
RN 845815-80-7 HCAPLUS
CN 1,3-Disilacyclobutane, 1,3-dimethyl-1,3-bis[3-(oxiranylmethoxy)propyl]- (9CI) (CA INDEX NAME)



IT **106-92-3D**, Allyl glycidyl ether, reaction products with poly(Me hydrogencarbosilanes)
RL: RCT (Reactant); RACT (Reactant or reagent)
(prepn. of hard **masks** for extreme-UV **photolithog.**)
RN 106-92-3 HCAPLUS
CN Oxirane, [(2-propenyloxy)methyl]- (9CI) (CA INDEX NAME)



IC ICM G03F007-00
INCL 430270100; 430322000; 430950000
CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)
Section cross-reference(s): 35, 38, 76
ST **antireflective** hard **mask photolithog** semiconductor device fabrication
IT **Antireflective** films
Semiconductor device fabrication
(**antireflective** hard **mask** for extreme-UV **photolithog.**)
IT **Photolithography**
(extreme-UV; **antireflective** hard **mask** for extreme-UV **photolithog.**)
IT Silsesquioxanes
RL: DEV (Device component use); USES (Uses)
(polycarbosilane-; **antireflective** hard **mask** for extreme-UV **photolithog.**)
IT Polycarbosilanes
RL: DEV (Device component use); USES (Uses)
(silsesquioxane-; **antireflective** hard **mask** for extreme-UV **photolithog.**)
IT **2530-83-8D**, Glycidoxypropyltrimethoxysilane, reaction products with dimethoxypolycarbosilane **2996-92-1D**,

Phenyltrimethoxysilane, reaction products with dimethoxypolycarbosilane
RL: NUU (Other use, unclassified); USES (Uses)
(**antireflective** hard **mask** for extreme-UV **photolithog.**)

IT **106-92-3P**, Allyl glycidyl ether **62306-27-8DP**, Poly[(methylsilylene)(methylene)], reaction product with allyl glycidyl ether **845815-81-8P 845815-82-9P 845815-83-0P**
RL: NUU (Other use, unclassified); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
(**antireflective** hard **mask** for extreme-UV **photolithog.**)

IT **1627-98-1 1628-01-9**
RL: RCT (Reactant); RACT (Reactant or reagent)
(**antireflective** hard **mask** for extreme-UV **photolithog.**)

IT **845815-80-7P**
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)
(**antireflective** hard **mask** for extreme-UV **photolithog.**)

IT **106-92-3D**, Allyl glycidyl ether, reaction products with poly(Me hydrogencarbosilanes)
RL: RCT (Reactant); RACT (Reactant or reagent)
(prepn. of hard **masks** for extreme-UV **photolithog.**)

L31 ANSWER 3 OF 8 HCAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 2004:60390 HCAPLUS
DOCUMENT NUMBER: 140:89912
TITLE: **Antireflective** silicon-containing polymer compositions as hardmask layer
INVENTOR(S): Angelopoulos, Marie; Ariram, Ari; Guarnieri, C. Richard; Huang, Wu-Song; Kwong, Ranee; Moreau, Wayne M.
PATENT ASSIGNEE(S): International Business Machines Corporation, USA
SOURCE: PCT Int. Appl., 21 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2004007192	A1	20040122	WO 2002-US22176	200207 11
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W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZM, ZW				
RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG				
AU 2002329596	A1	20040202	AU 2002-329596	200207 11
			<--	

EP 1521797 A1 20050413 EP 2002-765835
200207
11
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R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, SK
JP 2005520354 T2 20050707 JP 2004-521395
200207
11
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CN 1638955 A 20050713 CN 2002-829300
200207
11
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PRIORITY APPLN. INFO.: WO 2002-US22176 A
200207
11
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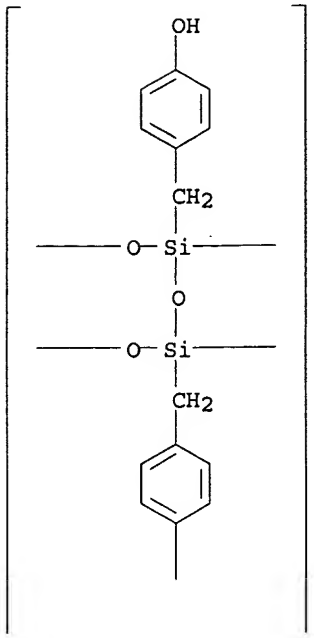
AB **Antireflective** compns. characterized by the presence of an SiO-contg. polymer having pendant chromophore moieties are useful **antireflective** coating/hardmask compns. in **lithog.** processes. These compns. provide outstanding optical, mech. and etch selectivity properties while being applicable using spin-on application techniques. The compns. are esp. useful in **lithog.** processes used to configure underlying material layers on a substrate, esp. metal or semiconductor layers. A polymer was prepd. by reaction of 9-anthracenemethanol with poly(4-hydroxybenzylsilsesquioxane).

IT **188629-68-7DP**, 4-Hydroxybenzylsilanetriol homopolymer, sru, reaction products with 9-anthracene
RL: IMF (Industrial manufacture); POF (Polymer in formulation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(**antireflective** silicon-contg. polymer compns. as hardmask layer)

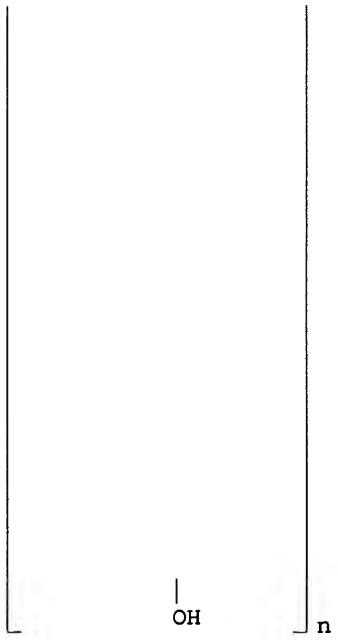
RN 188629-68-7 HCAPLUS

CN Poly[[1,3-bis[(4-hydroxyphenyl)methyl]-1,3:1,3-disiloxanediylidene]-1,3-bis(oxy)] (9CI) (CA INDEX NAME)

PAGE 1-A



PAGE 2-A



IC ICM B32B009-04
ICS B05D005-00; C08J007-18; C08G077-04; G03C001-76
CC 7-6 (Enzymes)
Section cross-reference(s): 74
ST siloxane silsesquioxane chromophore deriv **antireflective** layer hardmask
IT **Antireflective** films

(**antireflective** silicon-contg. polymer compns. as hardmask layer)

IT Polysiloxanes, uses
Silsesquioxanes
RL: TEM (Technical or engineered material use); USES (Uses)
(**antireflective** silicon-contg. polymer compns. as hardmask layer)

IT 1468-95-7DP, 9-Anthracenemethanol, reaction products with poly(4-hydroxybenzylsilsesquioxane) **188629-68-7DP**, 4-Hydroxybenzylsilanetriol homopolymer, sru, reaction products with 9-anthracene
RL: IMF (Industrial manufacture); POF (Polymer in formulation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(**antireflective** silicon-contg. polymer compns. as hardmask layer)

IT 188557-77-9DP, 4-Hydroxybenzylsilanetriol homopolymer, reaction products with 9-anthracene
RL: IMF (Industrial manufacture); POF (Polymer in formulation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(assumed monomer; **antireflective** silicon-contg. polymer compns. as hardmask layer)

IT 496-46-8D, Glycoluril, resins
RL: RCT (Reactant); TEM (Technical or engineered material use); RACT (Reactant or reagent); USES (Uses)
(**crosslinking** agent; **antireflective** silicon-contg. polymer compns. as hardmask layer)

REFERENCE COUNT: 1 THERE ARE 1 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L31 ANSWER 4 OF 8 HCAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 2003:836473 HCAPLUS
DOCUMENT NUMBER: 139:330334
TITLE: **Antireflective** SiO-containing compositions for hard **mask** layer
INVENTOR(S): Pfeiffer, Dirk; Angelopoulos, Marie; Babich, Katherina; Brock, Phillip; Huang, Wu-Song; Mahorowala, Arpan P.; Medeiros, David R.; Sooriyakumaran, Ratnam
PATENT ASSIGNEE(S): International Business Machines Corporation, USA
SOURCE: U.S. Pat. Appl. Publ., 7 pp.
CODEN: USXXCO
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 2003198877	A1	20031023	US 2002-124087	20020416
US 6730454	B2	20040504	<--	
WO 2003089992	A1	20031030	WO 2003-US10590	20030401

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W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL,

TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VC, VN, YU, ZA, ZM, ZW
RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG

AU 2003230825	A1	20031103	AU 2003-230825	200304 01 <--
EP 1495365	A1	20050112	EP 2003-723925	200304 01 <--
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, SK				
CN 1646989	A	20050727	CN 2003-807642	200304 01 <--
JP 2005523474	T2	20050804	JP 2003-586669	200304 01 <--
PRIORITY APPLN. INFO.:			US 2002-124087 A	200204 16 <--
			WO 2003-US10590 W	200304 01 <--

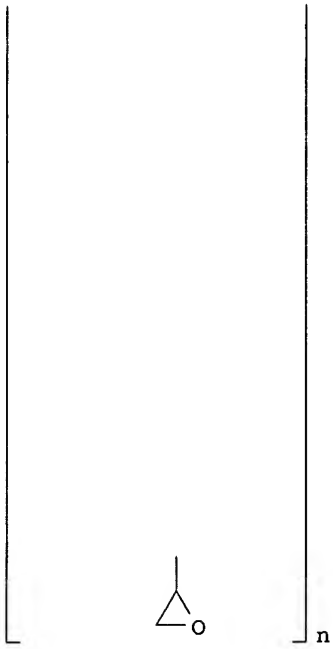
AB **Antireflective** compns. characterized by the presence of an SiO-contg. polymer having chromophore moieties and transparent moieties are useful **antireflective** hard **mask** compns. in **lithog.** processes. These compns. provide outstanding optical, mech. and etch selectivity properties while being applicable using spin-on application techniques. The compns. of the invention are advantageously useful with shorter wavelength **lithog.** processes and/or have minimal residual acid content.

IT **162477-44-3P**, 3-Glycidoxypropyltrimethoxysilane homopolymer, ladder, sru
RL: SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(**antireflective** SiO-contg. compns. for hard **mask** layer)

RN 162477-44-3 HCAPLUS

CN Poly[[1,3-bis[3-(oxiranylmethoxy)propyl]-1,3:1,3-disiloxanediylidene]-1,3-bis(oxy)] (9CI) (CA INDEX NAME)

* STRUCTURE DIAGRAM TOO LARGE FOR DISPLAY - AVAILABLE VIA OFFLINE PRINT *



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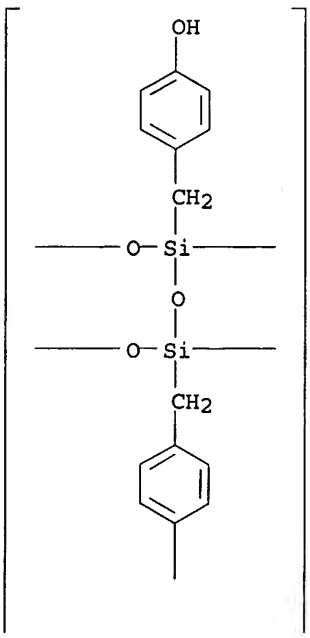
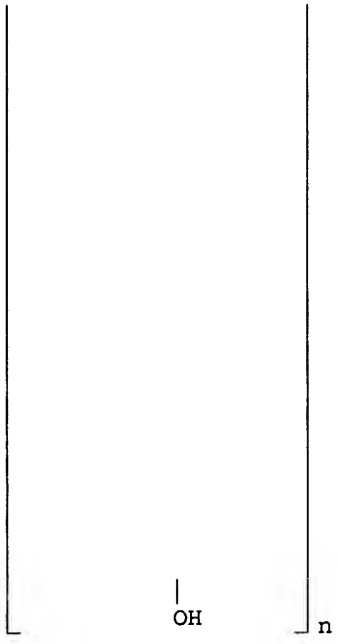
IT **188629-68-7**
RL: TEM (Technical or engineered material use); USES (Uses)
(**antireflective** SiO-contg. compns. for hard **mask** layer)
RN 188629-68-7 HCAPLUS
CN Poly[[1,3-bis[(4-hydroxyphenyl)methyl]-1,3:1,3-disiloxanediylidene]-1,3-bis(oxy)] (9CI) (CA INDEX NAME)

PAGE 1-A





PAGE 2-A

IC ICM G03F007-004
ICS G03F007-075; G03F007-20; G03F007-095
INCL 430015000; 430270100; 430281100; 430296000; 430316000; 430950000
CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)
Section cross-reference(s): 35, 38
ST **antireflective** SiO compn hard **mask** layer **lithog**
IT **Antireflective** films
Photomasks (lithographic masks)
(**antireflective** SiO-contg. compns. for hard **mask** layer)
IT Silsesquioxanes
RL: TEM (Technical or engineered material use); USES (Uses)
(**antireflective** SiO-contg. compns. for hard **mask** layer)
IT **Lithography**
(**antireflective** SiO-contg. compns. for hard **mask** layer of)
IT 218151-20-3
RL: TEM (Technical or engineered material use); USES (Uses)
(acid generator; **antireflective** SiO-contg. compns. for hard **mask** layer)
IT 56325-93-0P, 3-Glycidoxypropyltrimethoxysilane homopolymer **162477-44-3P**, 3-Glycidoxypropyltrimethoxysilane homopolymer, ladder, sru 181258-32-2P
RL: SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(**antireflective** SiO-contg. compns. for hard **mask** layer)
IT 188557-77-9 **188629-68-7** 614753-73-0 614753-74-1
RL: TEM (Technical or engineered material use); USES (Uses)
(**antireflective** SiO-contg. compns. for hard **mask** layer)
IT 17464-88-9, Tetramethoxymethyl glycoluril
RL: TEM (Technical or engineered material use); USES (Uses)
(**crosslinker**; **antireflective** SiO-contg.

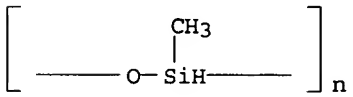
compns. for hard **mask** layer)
REFERENCE COUNT: 8 THERE ARE 8 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L31 ANSWER 5 OF 8 HCAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 2002:908047 HCAPLUS
DOCUMENT NUMBER: 138:161601
TITLE: Optimization of polysilane structure as fast-etching bottom **antireflective** coating for deep ultraviolet **lithography**
AUTHOR(S): Sato, Yasuhiko; Matsuyama, Hideto; Onishi, Yasunobu; Nakano, Yoshihiko; Hayase, Shuji
CORPORATE SOURCE: Process and Manufacturing Engineering Center, Toshiba Corporation, Yokohama, 235-8522, Japan
SOURCE: Japanese Journal of Applied Physics, Part 1: Regular Papers, Short Notes & Review Papers (**2002**), 41(11A), 6351-6355
CODEN: JAPNDE
PUBLISHER: Japan Society of Applied Physics
DOCUMENT TYPE: Journal
LANGUAGE: English

AB A bottom **antireflective** coating (BARC) is essential for deep UV **lithog.** The authors have already reported the BARC composed of polysilanes which can be spin coated and etched faster than resists. Polysilane structures are optimized to set the etch selectivity against resists to a higher level than that previously reported without losing the antireflection performance. The networked polysilanes structure is the most suitable. Poly(methylhydrosilane) whose Si-H is partially **cross-linked** and has the highest silicon content of 64.8% yields the optimal results. The resist profile is achieved on it without footing and residue. The refractive index at the wavelength of KrF excimer (248 nm) is n = 1.93, k = 0.32, and the polymer reduces multi-reflection in both resists and in transparent substrates. The etch selectivities are 4.8 under Cl2 plasma and 6.6 under HBr plasma, which are much higher than that of an org. BARC, .apprx.1.

IT **9004-73-3**, Poly[oxy(methylsilylene)]
RL: RCT (Reactant); TEM (Technical or engineered material use); RACT (Reactant or reagent); USES (Uses)
(optimization of polysilane structure as fast-etching bottom **antireflective** coating for deep UV **lithog.**)
RN 9004-73-3 HCAPLUS
CN Poly[oxy(methylsilylene)] (8CI, 9CI) (CA INDEX NAME)

Not carbosilane



CC 76-3 (Electric Phenomena)
ST antireflection coating UV **lithog** bottom etching
IT **Photolithography**
(UV; optimization of polysilane structure as fast-etching bottom **antireflective** coating for deep UV **lithog.**)
IT **Antireflective** films
Etching
Photoresists
Semiconductor device fabrication
(optimization of polysilane structure as fast-etching bottom **antireflective** coating for deep UV **lithog.**)
IT Polysilanes
RL: RCT (Reactant); TEM (Technical or engineered material use); RACT (Reactant or reagent); USES (Uses)

(optimization of polysilane structure as fast-etching bottom **antireflective** coating for deep UV **lithog.**)

IT **9004-73-3**, Poly[oxy(methylsilylene)]
RL: RCT (Reactant); TEM (Technical or engineered material use); RACT (Reactant or reagent); USES (Uses)
(optimization of polysilane structure as fast-etching bottom **antireflective** coating for deep UV **lithog.**)

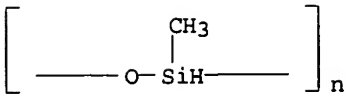
REFERENCE COUNT: 14 THERE ARE 14 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L31 ANSWER 6 OF 8 HCAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 2002:433296 HCAPLUS
DOCUMENT NUMBER: 137:317786
TITLE: Highly **crosslinked** polysilane as **antireflective** coating for deep-ultraviolet **lithography** to improve durability during SiO2 etching
AUTHOR(S): Sato, Yasuhiko; Shiobara, Eishi; Onishi, Yasunobu; Yoshikawa, Sawako; Nakano, Yoshihiko; Hayase, Shuzi; Hamada, Yoshitaka
CORPORATE SOURCE: Toshiba Corporation, Process and Manufacturing Engineering Center, Shinsugita-cho, Isogo-ku, Yokohama, 235-8522, Japan
SOURCE: Journal of Vacuum Science & Technology, B: Microelectronics and Nanometer Structures (**2002**), 20(3), 909-913
CODEN: JVTBD9; ISSN: 0734-211X
PUBLISHER: American Institute of Physics
DOCUMENT TYPE: Journal
LANGUAGE: English

AB Highly **crosslinked** polysilanes were recently investigated in an attempt to improve drawbacks of bottom **antireflective** coatings (BARCs) composed of loosely **crosslinked** polysilanes that are used for deep-UV **lithog.** A highly **crosslinked** structure was prepd. by thermally **crosslinking** poly(phenylmethylsilane-methylhydrosilane-methysilyne) with m-diethynylbenzene during baking after coating. Resist profiles are achieved on it without producing a foot or leaving residue at the bottom of the resist. The refractive indexes at the KrF excimer laser wavelength (248 nm) are n = 1.93 and k = 0.32. The reflection is reduced 0.9% regardless of variation in the thickness of the substrate. Highly **crosslinked** polysilanes improve the melting of loosely **crosslinked** polysilanes during BARC etching. They also improve the surface roughness of loosely **crosslinked** polysilanes after substrate (-SiO2) etching. The etch selectivity of the highly **crosslinked** polysilane BARC/resist during BARC etching is 2.1, which is higher than that of org. BARC/resist (.apprx.1). The etch resistance of the highly **crosslinked** polysilane during substrate etching is 1.1 times greater than that of the resist. Highly **crosslinked** polysilanes can not only be etched with high selectivity against resist but can also be superior etch **mask** for substrate etching.

IT **9004-73-3**, Poly[oxy(methylsilylene)]
RL: PRP (Properties); RCT (Reactant); TEM (Technical or engineered material use); RACT (Reactant or reagent); USES (Uses)
(partially **crosslinked**; properties of partially **crosslinked** polysilanes and polysilanes highly **crosslinked** with diethynylbenzene as bottom **antireflective** coating for deep-UV **lithog.**)

RN 9004-73-3 HCAPLUS
CN Poly[oxy(methylsilylene)] (8CI, 9CI) (CA INDEX NAME)



CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)

ST **crosslinked** polysilane **antireflective** coating deep UV **lithog**; **photolithog** deep UV **crosslinked** polysilane **antireflective** coating

IT Polysilanes
RL: PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(**crosslinked**; properties of partially **crosslinked** polysilanes and polysilanes highly **crosslinked** with diethynylbenzene as bottom **antireflective** coating for deep-UV **lithog.**)

IT Photoresists
(deep-UV; polysilanes highly **crosslinked** with diethynylbenzene as bottom **antireflective** coating for deep-UV **lithog.**)

IT Optical reflection
Refractive index
Surface roughness
(**lithog.** performance of polysilane highly **crosslinked** with diethynylbenzene as bottom **antireflective** coating for deep-UV **lithog.**)

IT Polycarbosilanes
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(polyacetylene-; **lithog.** performance of polysilane highly **crosslinked** with diethynylbenzene as bottom **antireflective** coating for deep-UV **lithog.**)

IT Polyacetylenes, properties
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(polycarbosilane-; **lithog.** performance of polysilane highly **crosslinked** with diethynylbenzene as bottom **antireflective** coating for deep-UV **lithog.**)

IT **Antireflective** films
(properties of partially **crosslinked** polysilanes and polysilanes highly **crosslinked** with diethynylbenzene as bottom **antireflective** coating for deep-UV **lithog.**)

IT Etching
(sputter, ion-beam, reactive; **lithog.** performance of polysilane highly **crosslinked** with diethynylbenzene as bottom **antireflective** coating for deep-UV **lithog.**)

IT **Crosslinking**
(thermal; properties of partially **crosslinked** polysilanes and polysilanes highly **crosslinked** with diethynylbenzene as bottom **antireflective** coating for deep-UV **lithog.**)

IT 115-25-3, Perfluorocyclobutane 630-08-0, Carbon monoxide, uses 7440-37-1, Argon, uses 7782-44-7, Oxygen, uses
RL: NUU (Other use, unclassified); USES (Uses)
(RIE; **lithog.** performance of polysilane highly **crosslinked** with diethynylbenzene as bottom **antireflective** coating for deep-UV **lithog.**)

IT 471283-14-4
RL: PEP (Physical, engineering or chemical process); PRP

(Properties); PYP (Physical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(**lithog.** performance of polysilane highly **crosslinked** with diethynylbenzene as bottom **antireflective** coating for deep-UV **lithog.**)

IT 7631-86-9, Silica, processes
RL: PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process)
(**lithog.** performance of polysilane highly **crosslinked** with diethynylbenzene as bottom **antireflective** coating for deep-UV **lithog.**)

IT 1785-61-1, m-Diethynylbenzene
RL: RCT (Reactant); RACT (Reactant or reagent)
(**lithog.** performance of polysilane highly **crosslinked** with diethynylbenzene as bottom **antireflective** coating for deep-UV **lithog.**)

IT **9004-73-3**, Poly[oxy(methylsilylene)] 49718-23-2 156894-03-0 471283-13-3
RL: PRP (Properties); RCT (Reactant); TEM (Technical or engineered material use); RACT (Reactant or reagent); USES (Uses)
(partially **crosslinked**; properties of partially **crosslinked** polysilanes and polysilanes highly **crosslinked** with diethynylbenzene as bottom **antireflective** coating for deep-UV **lithog.**)

IT 95584-36-4, Phenyldichlorosilane homopolymer, sru 99936-07-9, Phenyldichlorosilane homopolymer
RL: PRP (Properties); RCT (Reactant); TEM (Technical or engineered material use); RACT (Reactant or reagent); USES (Uses)
(properties of partially **crosslinked** polysilanes and polysilanes highly **crosslinked** with diethynylbenzene as bottom **antireflective** coating for deep-UV **lithog.**)

REFERENCE COUNT: 8 THERE ARE 8 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L31 ANSWER 7 OF 8 HCAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 2002:129153 HCAPLUS
DOCUMENT NUMBER: 136:191690
TITLE: Acrylic photoresist polymers bearing cyclotetrasiloxanyl groups, their preparation, composition, and **photolithography** thereof
INVENTOR(S): Lee, Geun Su; Koh, Cha Won; Jung, Jae Chang; Jung, Min Ho; Baik, Ki Ho
PATENT ASSIGNEE(S): Hynix Semiconductor Co., Ltd., S. Korea
SOURCE: Jpn. Kokai Tokkyo Koho, 22 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2002053623	A2	20020219	JP 2001-188341	200106 21 <--
JP 3688222	B2	20050824		
KR 2002000059	A	20020104	KR 2000-34102	200006 21 <--
US 2002028406	A1	20020307	US 2001-852371	

200105
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US 6569599 B2 20030527

PRIORITY APPLN. INFO.: KR 2000-34102 A
200006
21
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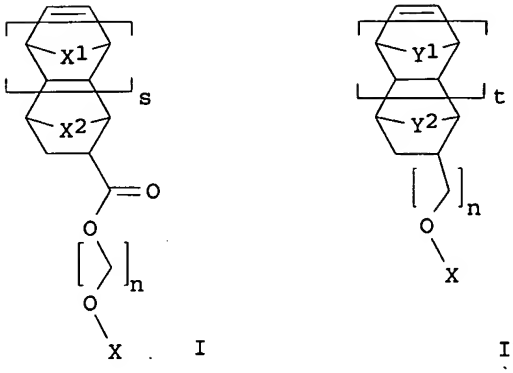
GI



I II

AB The polymers with mol. wt. 3000-50,000 are prepd. by polymn. of (i) monomers represented by R5C(:CH2)CO2(CH2)nOX [R1-4 (in X definition) = H, C1-10 alkyl; R5 = H, Me], I (X1, X2 = CH2, CH2CH2; s = 0, 1, 2), and/or II (Y1, Y2 = CH2, CH2CH2; t = 0, 1, 2), (ii) R6C(:CH2)(CH2)mCO2R7 (R6 = H, Me; R7 = acid-labile protective group; m = 0-5 integer), and (iii) (meth)acrylic acid and may contain **crosslinking** agents R9C(:CH2)CO2CR11R12YCR13R14OCOC(:CH2)R10 and/or maleic anhydride. The polymers are prepd. by catalyst-assisted polymn. Chem.-amplified pos. photoresists comprising the polymers are also claimed. A bilayer resist process employing the photoresists and underlayers which are chosen from bottom **antireflective** coatings or i- or g-line photosensitizer coatings, is further claimed. The photoresists keep pattern sharpness during plasma etching for the underlayer patterning.

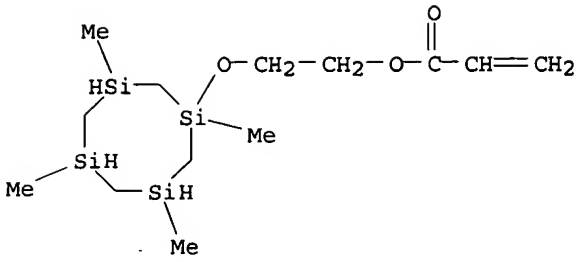
IT **399557-22-3P 399557-23-4P 399557-24-5P**
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(Si-rich acrylic polymers bearing acid-labile cyclosiloxanyl groups for photoresists with superior etching resistance)

RN 399557-22-3 HCAPLUS

CN 2-Propenoic acid, 2-methyl-, polymer with 1,1-dimethylethyl 2-methyl-2-propenoate, 2,2-dimethyl-1,3-propanediyl di-2-propenoate and 2-[(1,3,5,7-tetramethyl-1,3,5,7-tetrasilacyclooct-1-yl)oxy]ethyl 2-propenoate (9CI) (CA INDEX NAME)

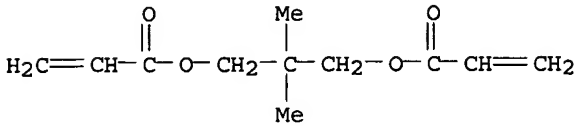
CM 1

CRN 356043-15-7
CMF C13 H30 O3 Si4



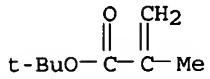
CM 2

CRN 2223-82-7
CMF C11 H16 O4



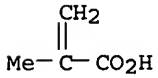
CM 3

CRN 585-07-9
CMF C8 H14 O2



CM 4

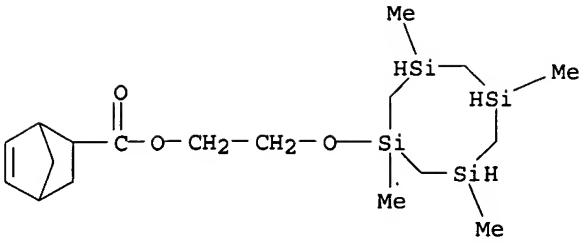
CRN 79-41-4
CMF C4 H6 O2



RN 399557-23-4 HCAPLUS
CN Bicyclo[2.2.1]hept-5-ene-2-carboxylic acid, 2-[(1,3,5,7-tetramethyl-1,3,5,7-tetrasilacyclooct-1-yl)oxy]ethyl ester, polymer with 1,1-dimethylethyl 2-methyl-2-propenoate, 2,5-furandione, 2-methyl-2-propenoic acid and 1,1,4,4-tetramethyl-1,4-butanediyl di-2-propenoate (9CI) (CA INDEX NAME)

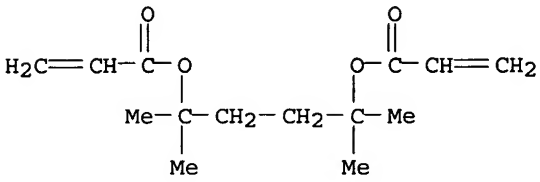
CM 1

CRN 356043-16-8
CMF C18 H36 O3 Si4



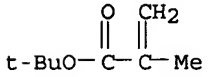
CM 2

CRN 188837-15-2
CMF C14 H22 O4



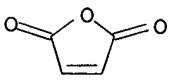
CM 3

CRN 585-07-9
CMF C8 H14 O2



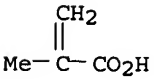
CM 4

CRN 108-31-6
CMF C4 H2 O3



CM 5

CRN 79-41-4
CMF C4 H6 O2

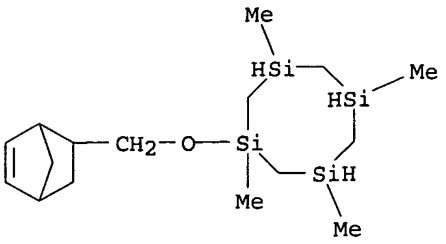


RN 399557-24-5 HCAPLUS
CN 2-Propenoic acid, 2-methyl-, polymer with 1-(bicyclo[2.2.1]hept-5-en-

2-ylmethoxy)-1,3,5,7-tetramethyl-1,3,5,7-tetrasilacyclooctane, 1,1-dimethylethyl 2-methyl-2-propenoate, 2,5-furandione and 1,1,4,4-tetramethyl-1,4-butanediyl di-2-propenoate (9CI) (CA INDEX NAME).

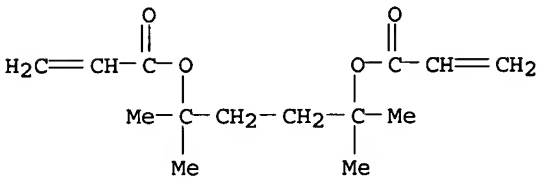
CM 1

CRN 356043-17-9
CMF C16 H34 O Si4



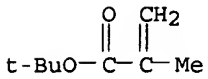
CM 2

CRN 188837-15-2
CMF C14 H22 O4



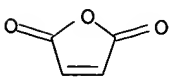
CM 3

CRN 585-07-9
CMF C8 H14 O2



CM 4

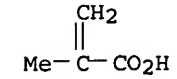
CRN 108-31-6
CMF C4 H2 O3



CM 5

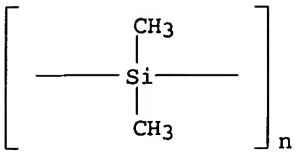
CRN 79-41-4

CMF C4 H6 O2



IC ICM C08F230-08
ICS C08F220-28; C08K005-00; C08L101-02; G03F007-004; G03F007-039; G03F007-075; G03F007-11; G03F007-26; H01L021-027
CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)
Section cross-reference(s): 38, 76
ST silicon rich acrylic photoresist cyclosiloxanyl protected; amplified photoresist acrylic cyclosiloxanyl protective group; semiconductor bilayer resist **photolithog** acrylic photoresist
IT **Photolithography**
(bilayer resist process; Si-rich acrylic polymers bearing acid-labile cyclosiloxanyl groups for photoresists with superior etching resistance)
IT **399557-22-3P 399557-23-4P 399557-24-5P**
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(Si-rich acrylic polymers bearing acid-labile cyclosiloxanyl groups for photoresists with superior etching resistance)

L31 ANSWER 8 OF 8 HCAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 1994:204337 HCAPLUS
DOCUMENT NUMBER: 120:204337
TITLE: New silicon-rich silylating reagents for dry-developed positive-tone deep-ultraviolet **lithography**
AUTHOR(S): Wheeler, David R.; Hutton, Skip; Stein, Susan; Baiocchi, Frank; Cheng, May; Taylor, Gary
CORPORATE SOURCE: Dep. 1811, Sandia Natl. Lab., Albuquerque, NM, 87185, USA
SOURCE: Journal of Vacuum Science & Technology, B: Microelectronics and Nanometer Structures (**1993**), 11(6), 2789-93
CODEN: JVTBD9; ISSN: 0734-211X
DOCUMENT TYPE: Journal
LANGUAGE: English
AB Disilanes are used as silylating reagents for near-surface imaging with deep UV (248 nm) light. A relatively thin imaging layer of a photo-**crosslinking** resist spun over a thicker layer of hard-baked resist which functions as a planarizing layer and **antireflective** coating. Photoinduced acid generation and subsequent heating **cross-links** exposed areas and renders them impermeable to an aminodisilane which reacts with the unexposed regions. Subsequent O2 reactive-ion etching affords a pos.-tone image in the resist. The use of disilanes introduces a higher concn. of silicon into the polymer than is possible with silicon reagents that incorporate only one silicon atom per reactive site. The higher silicon content in the silylated polymer increases etching selectivity between exposed and unexposed regions and thereby increases the contrast. The authors have resolved high-aspect ratio, 0.25 μm line and space patterns with 248 nm light in a stepper with a numerical aperture of 0.48.
IT **28883-63-8**, Poly(dimethylsilane)
RL: USES (Uses)
(silylating reagent for dry-developed pos.-tone deep-UV **lithog.**)
RN 28883-63-8 HCAPLUS
CN Poly(dimethylsilylene) (8CI, 9CI) (CA INDEX NAME)



CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)
Section cross-reference(s): 76
ST silicon rich silylating reagent UV **photolithog**; disilane silylating reagent deep UV **photolithog**; bilayer photoresist disilane silylating agent **lithog**
IT Silanes
RL: USES (Uses)
(di-, as silylating reagents for dry-developed pos.-tone deep-UV **lithog.**)
IT Silylation
(agents, silicon-rich,for dry-developed pos.-tone deep-UV **lithog.**)
IT Electric circuits
(integrated, silicon-rich silylating reagents for dry-developed pos.-tone deep-UV **lithog.** in fabrication of)
IT **Lithography**
(photo-, UV, submicron, silicon-rich silylating reagents for dry-developed pos.-tone)
IT 2083-91-2, Dimethylaminotrimethylsilane 2875-98-1 3704-46-9, Dodecamethylpentasilane 4774-84-9 22705-32-4, N,N-Dimethylaminodimethylsilane 26798-98-1, N,N-Dimethylaminopentamethyldisilane **28883-63-8**, Poly(dimethylsilane) 38041-04-2, Octamethylcyclotetrasilane 72059-93-9 78635-80-0, N-Methylaminopentamethyldisilane
RL: USES (Uses)
(silylating reagent for dry-developed pos.-tone deep-UV **lithog.**)

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USE IS SUBJECT TO THE TERMS OF YOUR STN CUSTOMER AGREEMENT.
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=> d l30 que stat
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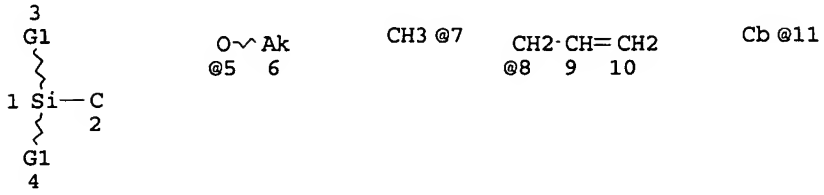

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GGCAT IS UNS AT 11
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RING(S) ARE ISOLATED OR EMBEDDED
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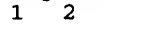

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DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:
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NUMBER OF NODES IS 2

STEREO ATTRIBUTES: NONE
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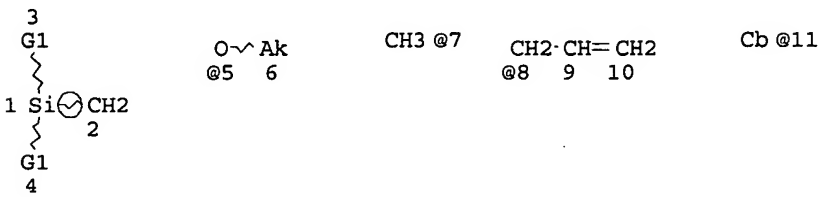

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GGCAT IS UNS AT 11
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GRAPH ATTRIBUTES:
RING(S) ARE ISOLATED OR EMBEDDED
NUMBER OF NODES IS 11

STEREO ATTRIBUTES: NONE
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=> d l30 1-24 ibib abs hitstr hitind

L30  ANSWER 1 OF 24  HCAPLUS  COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER:         2005:588247  HCAPLUS
DOCUMENT NUMBER:          143:106478
TITLE:                    Elastomer spatial light modulators for extreme
                          ultraviolet lithography
INVENTOR(S):              Wang, Jen-Shiang; Jung, Il Woong; Solgaard, Olav
PATENT ASSIGNEE(S):       The Board of Trustees of the Leland Stanford
                          Junior University, USA
SOURCE:                   U.S. Pat. Appl. Publ., 12 pp.
                          CODEN: USXXCO
DOCUMENT TYPE:            Patent
LANGUAGE:                 English
FAMILY ACC. NUM. COUNT:   1
PATENT INFORMATION:

     PATENT NO.           KIND   DATE        APPLICATION NO.        DATE
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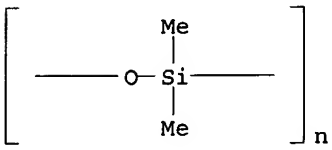
     US 2005146768         A1    20050707    US 2004-962055
                                                                   200410
                                                                   08
                                                                   <--
     US 7092138            B2    20060815
PRIORITY APPLN. INFO.:                       US 2003-510485P      P
                                                                   200310
                                                                   10
                                                                   <--
AB   Methods for fabricating elastomer spatial light modulators are
     described which entail depositing and patterning bottom electrodes
     on an insulation layer of a substrate; depositing a sacrificial
     layer on top of the bottom electrodes; patterning and polishing the
     sacrificial layer; depositing a shell layer on top of the
     sacrificial layer; depositing a single common electrode layer;
     depositing and patterning a reflective layer on top of the
     electrode layer; removing the sacrificial layer to form a cavity;
     and injecting an elastomer into the cavity.  Elastomer spatial light
     modulator are also described which comprise a silicon substrate; a
     plurality of bottom electrodes positioned on top of the silicon
     substrate; a single common top electrode; a two dimensional array of
     injection molded elastomer pillars positioned on top of the bottom
     electrodes and supporting the top electrode; and a
     reflective molybdenum/silicon multilayer stack deposited on
     top of the elastomer pillars.  Extreme UV lithog. systems
```

employing the elastomer spatial light modulators are also described.

IT **9016-00-6**, Sylgard 527
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process); USES (Uses)
(elastomer spatial light modulators and their fabrication and **maskless** extreme UV **lithog.** systems using them)

RN 9016-00-6 HCAPLUS

CN Poly[oxy(dimethylsilylene)] (8CI, 9CI) (CA INDEX NAME)



IC ICM G02F001-03
ICS G02F001-07

INCL 359245000

CC 74-13 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)
Section cross-reference(s): 73

ST **maskless** extreme UV **lithog** system elastomer spatial light modulator

IT Spatial light modulators
(elastomer spatial light modulators and their fabrication and **maskless** extreme UV **lithog.** systems using them)

IT Silicone rubber, processes
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process); USES (Uses)
(elastomer spatial light modulators and their fabrication and **maskless** extreme UV **lithog.** systems using them)

IT **Lithographic** apparatus
(extreme UV, **maskless**; elastomer spatial light modulators and their fabrication and **maskless** extreme UV **lithog.** systems using them)

IT 7439-98-7, Molybdenum, uses 7440-21-3, Silicon, uses
RL: DEV (Device component use); USES (Uses)
(elastomer spatial light modulators and their fabrication and **maskless** extreme UV **lithog.** systems using them)

IT **9016-00-6**, Sylgard 527 31900-57-9
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process); USES (Uses)
(elastomer spatial light modulators and their fabrication and **maskless** extreme UV **lithog.** systems using them)

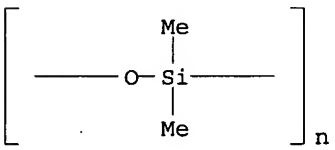
L30 ANSWER 2 OF 24 HCAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 2004:609813 HCAPLUS
DOCUMENT NUMBER: 141:164833
TITLE: Method of preparing patterned colloidal crystals
INVENTOR(S): Yang, Seung-Man; Yi, Ki-Ra; Park, Yong-Hak; Kim, Sarah
PATENT ASSIGNEE(S): Korea Advanced Institute of Science and Technology, S. Korea
SOURCE: U.S. Pat. Appl. Publ., 11 pp.
CODEN: USXXCO
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 2004146811	A1	20040729	US 2003-662088	20030912
			<--	
US 7063938	B2	20060620		
KR 2004067506	A	20040730	KR 2003-4638	20030123
			<--	
PRIORITY APPLN. INFO.:			KR 2003-4638 A	20030123
			<--	

AB Disclosed is a method of prepg. patterned colloidal crystals, including filling a monomer soln. in the interstices between particles of planar colloidal crystals for photopolymn. inside them, and performing a selective photopolymn. process between the colloidal crystals using a **mask.** Alternatively, disclosed is a method of prepg. patterned colloidal crystals, including filling a first monomer soln. for photopolymn. inside planar colloidal crystals, performing a first selective photopolymn. process inside the colloidal crystals using a **mask**, and filling a second monomer soln. for photopolymn. into firstly patterned colloidal crystals, followed by performing at least one photopolymn. process inside the firstly patterned colloidal crystals using an addnl. **mask.** By the above method, colloidal cryst. regions oriented in the same direction with different refractive indexes can be controlled in a level of μm. Further, repeated patterns can be inexpensively and easily prepd. The inventive method is advantageous in terms of the controllable optical properties of the colloidal crystals, for example, photonic band gaps, whereby end products can be used for panels having high reflectability of **reflective** microdisplays.

IT **9016-00-6**, Polydimethylsiloxane
RL: TEM (Technical or engineered material use); USES (Uses)
(method of prepg. patterned colloidal crystals)

RN 9016-00-6 HCAPLUS
CN Poly[oxy(dimethylsilylene)] (8CI, 9CI) (CA INDEX NAME)

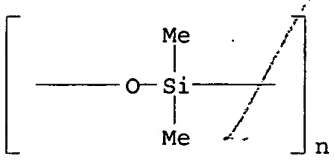


IC ICM G03C005-00
INCL 430322000; X43-027.01
CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)
ST patterned colloidal crystal prepn **lithog**
IT **Lithography**
(method of prepg. patterned colloidal crystals)
IT 7631-86-9, Silica, uses **9016-00-6**, Polydimethylsiloxane
31900-57-9, Polydimethylsiloxane 121239-75-6 727992-34-9
RL: TEM (Technical or engineered material use); USES (Uses)
(method of prepg. patterned colloidal crystals)
REFERENCE COUNT: 3 THERE ARE 3 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L30 ANSWER 3 OF 24 HCAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 2004:394617 HCAPLUS
DOCUMENT NUMBER: 142:228574
TITLE: Elastomer spatial light modulators for extreme ultraviolet **lithography**
AUTHOR(S): Wang, J.-S.; Jung, I. W.; Solgaard, O.
CORPORATE SOURCE: E. L. Ginzton Laboratory, Stanford University, Stanford, CA, 94305, USA
SOURCE: Transducers '03, International Conference on Solid-State Sensors, Actuators and Microsystems, Digest of Technical Papers, 12th, Boston, MA, United States, June 8-12, 2003 (**2003**), Volume 2, 1458-1461. Institute of Electrical and Electronics Engineers: New York, N. Y. CODEN: 69FHV2; ISBN: 0-7803-7731-1
DOCUMENT TYPE: Conference
LANGUAGE: English

AB In this paper, we present an elastomer spatial light modulator (SLM) that can be scaled to meet the requirements of extreme UV (EUV- 13 nm wavelength) **maskless lithog.** The feasibility of the proposed process was tested in a series of release and injection expts., which showed that the surface quality is not adversely affected by the introduction of a soft elastomer in the structure. We fabricated an elastomer SLM with an array of four by four micromirrors and demonstrated localized response. Anal. of the exptl. results showed that patterning of the **reflective** multilayer, as well as its supporting nitride shell and electrode, is required for SLMs with pixel sizes of 1 by 1 μm or less.

IT **9016-00-6**, Sylgard 527
RL: TEM (Technical or engineered material use); USES (Uses)
(elastomer spatial light modulators for extreme UV **lithog**.)
RN 9016-00-6 HCAPLUS
CN Poly[oxy(dimethylsilylene)] (8CI, 9CI) (CA INDEX NAME)



CC 74-6 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)
ST elastomer spatial light modulator extreme UV **lithog**
IT **Photolithography**
(UV; elastomer spatial light modulators for extreme UV **lithog.**)
IT Optical modulators
(elastomer spatial light modulators for extreme UV **lithog**.)
IT Silicone rubber, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(elastomer spatial light modulators for extreme UV **lithog**.)
IT Mirrors
(micro-; elastomer spatial light modulators for extreme UV **lithog.**)
IT **9016-00-6**, Sylgard 527 31900-57-9, Dimethylsilanediol homopolymer
RL: TEM (Technical or engineered material use); USES (Uses)
(elastomer spatial light modulators for extreme UV **lithog**.)
REFERENCE COUNT: 8 THERE ARE 8 CITED REFERENCES AVAILABLE FOR

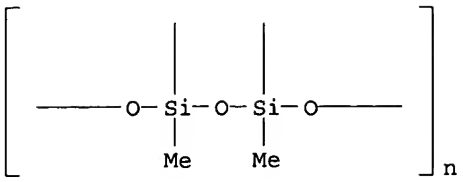
THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L30 ANSWER 4 OF 24 HCAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 2004:269810 HCAPLUS
DOCUMENT NUMBER: 140:295863
TITLE: Method for forming contact/via openings in low-k dielectric layers of semiconductor device
INVENTOR(S): Bao, Tien-I.; Li, Lih-Ping; Jang, Syun-Ming
PATENT ASSIGNEE(S): Taiwan Semiconductor Manufacturing Company, Taiwan
SOURCE: U.S. Pat. Appl. Publ., 14 pp.
CODEN: USXXCO
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 2
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 2004063308	A1	20040401	US 2002-256400	20020927
US 2005130411	A1	20050616	US 2004-808801	20040325
US 7001833	B2	20060221		
PRIORITY APPLN. INFO.:			US 2002-256400 A2	20020927

AB A method for etching contact/via openings in low-k dielec. layers is described. The method introduces a carbon deficient **antireflective** layer (ARL) which is compatible with the acidic photoresists used by deep UV (DUV) **photolithog.** The carbon deficiency of the ARL permits the use of fluorocarbon plasma etching ambients to etch the openings in the low-k layers without excessive polymer formation, thereby eliminating polymer pinch-off during the etching of deep, high aspect ratio contacts and vias in sub-tenth micron integrated circuit technol. Vertical walled contact and via openings may be formed using a DUV photoresist **mask** and non-oxygen contg. fluorocarbon etching plasmas. An addnl. hardmask is therefore not needed. For non-carbon contg. low-k dielec. layers the openings may be etched in simple fluorocarbon plasmas without excessive polymer formation. For low carbon low-k dielec. materials such as alky and aryl polysilsesquioxanes and some organosilicate glasses, the method provides a regimen of hydrogen addn. to the etching plasma in order to sufficiently control polymer formation during the contact/via etch to obtain high quality vertical walled openings.

IT **153315-80-1**, Methyl silsesquioxane
RL: DEV (Device component use); PRP (Properties); USES (Uses)
(formation of contact/via openings in low-k dielec. layers of semiconductor device)
RN 153315-80-1 HCAPLUS
CN Poly[(1,3-dimethyl-1,3:1,3-disiloxanediylidene)-1,3-bis(oxy)] (9CI) (CA INDEX NAME)



IC ICM H01L021-4763
ICS H01L021-31; H01L021-469; H01L021-44
INCL 438637000; 438780000; 438636000
CC 76-3 (Electric Phenomena)
IT **Photolithography**
(UV, deep UV; formation of contact/via openings in low-k dielec. layers of semiconductor device)
IT Aerogels
Antireflective films
Dielectric constant
Dielectric films
Electric conductors
Electric contacts
Electric insulators
Etching
Integrated circuits
Interconnections, electric
Photoresists
Semiconductor devices
Xerogels
(formation of contact/via openings in low-k dielec. layers of semiconductor device)
IT 39345-87-4, Silicon oxycarbide
RL: DEV (Device component use); USES (Uses)
(**antireflective** layers HSQ; formation of contact/via openings in low-k dielec. layers of semiconductor device)
IT **153315-80-1**, Methyl silsesquioxane 153315-81-2, Hydrogen silsesquioxane
RL: DEV (Device component use); PRP (Properties); USES (Uses)
(formation of contact/via openings in low-k dielec. layers of semiconductor device)

L30 ANSWER 5 OF 24 HCAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 2004:162093 HCAPLUS
DOCUMENT NUMBER: 140:208838
TITLE: Semiconductor device and method of manufacturing same
INVENTOR(S): Arita, Koji; Tagami, Masayoshi; Miyamoto, Hidenobu
PATENT ASSIGNEE(S): NEC Electronics Corporation, Japan
SOURCE: U.S. Pat. Appl. Publ., 18 pp.
CODEN: USXXCO
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 2004036076	A1	20040226	US 2003-642279	200308 18
JP 2004079901	A2	20040311	JP 2002-240803 <--	200208

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US 2005245075	A1	20051103	US 2005-174595	
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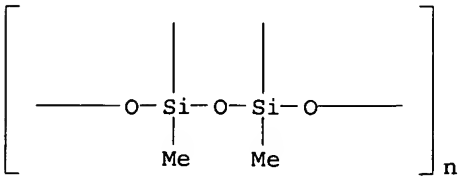
AB Disclosed is a semiconductor device having a precision-worked dual damascene structure to improve the device characteristics and a method for fabricating this shape. A semiconductor substrate was obtained by forming at least a 1st interlayer film, an etching stopper film, a 2nd interlayer film, a 1st hard **mask** and a 2nd hard **mask** on a substrate in the order mentioned, the 2nd hard **mask** being formed to have a trench pattern. At least a light absorbing sacrificial film, which has an etching rate different from that of a photoresist and is removable using a stripping soln., is formed on the semiconductor substrate in such a manner that the overall surface thereof will be flat. The photoresist is formed on the light absorbing sacrificial film and has an aperture pattern whose opening width is less than that of the trench pattern. At least the light absorbing sacrificial film, the 1st hard **mask** and the 2nd interlayer film are etched selectively, one after the other, using the photoresist as an etching **mask.**

IT **153315-80-1**, Methylsilsesquioxane
RL: CPS (Chemical process); NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(semiconductor device and method of manufg. with precision dual damascene structure)

RN 153315-80-1 HCAPLUS

CN Poly[(1,3-dimethyl-1,3:1,3-disiloxanediylidene)-1,3-bis(oxy)] (9CI) (CA INDEX NAME)



IC ICM H01L027-15
INCL 257079000
CC 76-3 (Electric Phenomena)
Section cross-reference(s): 48, 74

IT **Antireflective** films
Dielectric films
Dyes
Etch stops
Etching
Etching **masks**
Interconnections, electric

Photolithography
Photoresists
Semiconductor device fabrication
Semiconductor devices
(semiconductor device and method of manufg. with precision dual damascene structure)

IT **153315-80-1**, Methylsilsesquioxane
RL: CPS (Chemical process); NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(semiconductor device and method of manufg. with precision dual damascene structure)

L30 ANSWER 6 OF 24 HCAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 2004:2893 HCAPLUS
DOCUMENT NUMBER: 140:59780
TITLE: Preparation of silyl alkyl esters of anthracene- and phenanthrene carboxylic acids as anti-**reflective** layers for **photolithographic** applications
INVENTOR(S): Lehmann, Lutz Uwe; Lonsky, Ralph
PATENT ASSIGNEE(S): Honeywell Specialty Chemicals Seelze G.m.b.H., Germany
SOURCE: PCT Int. Appl., 40 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

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RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG				
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OTHER SOURCE(S): CASREACT 140:59780; MARPAT 140:59780
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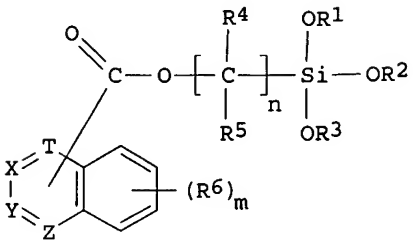


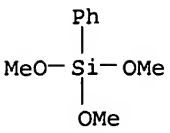
I

AB The invention relates to the prepn. of silyl alkyl esters I (R1, R2, R3 = same or different alkyl, aryl, heteroaryl; R4, R5 = same or different H, halo, alkyl, aryl, heteroaryl; n = 1-10; R6 = halo, alkyl, aryl, heteroaryl, OH, alkoxy, aryl ether, (un)substituted amino, carboxy, carboxy, carboxylic amido, sulfonic acid ester, sulfonyl, thio, thioether, nitro, etc.; m = 0-4; T, X, Y, Z = C, a benzo group, which is substituted m-fold with R6 or unsubstituted , is condensed on the bonds T-X, X-Y, or Y-Z to form a trinuclear arom. ring system, etc.), in particular of anthracene and phenanthrene carboxylic acids, a process for their prepn., compns. and polysiloxane compns. which contain the silyl alkyl esters and which can be used in particular in the semiconductor industry for the prepn. of anti-**reflective** layers for **photolithog.** applications.

IT **2996-92-1**, Phenyltrimethoxysilane
RL: RCT (Reactant); RACT (Reactant or reagent)
(prepn. of silyl alkyl esters of anthracene and phenanthrene carboxylic acids as anti-**reflective** layers for **photolithog.** applications)

RN 2996-92-1 HCAPLUS

CN Silane, trimethoxyphenyl- (6CI, 7CI, 8CI, 9CI) (CA INDEX NAME)



IC ICM C07F007-18
CC 29-7 (Organometallic and Organometalloidal Compounds)
Section cross-reference(s): 37, 76
ST silyl alkyl ester anthracene phenanthrene carboxylic acid prepn; anti **reflective** layer **photolithog** silyl ester anthracene phenanthrene carboxylic
IT Coating materials
Photolithography
(prepn. of silyl alkyl esters of anthracene and phenanthrene carboxylic acids as anti-**reflective** layers for **photolithog.** applications)
IT Polysiloxanes, properties
RL: PRP (Properties)
(prepn. of silyl alkyl esters of anthracene and phenanthrene carboxylic acids as anti-**reflective** layers for **photolithog.** applications)
IT 75-54-7, Methyldichlorosilane 75-78-5, Dimethyldichlorosilane 75-79-6, Methyltrichlorosilane 78-10-4, Tetraethoxysilane 78-62-6, Dimethyldiethoxysilane 98-13-5, Phenyltrichlorosilane 115-21-9, Ethyltrichlorosilane 681-84-5, Tetramethoxysilane 780-69-8, Phenyltriethoxysilane 998-30-1, Triethoxysilane 1112-39-6, Dimethyldimethoxysilane 1185-55-3, Methyltrimethoxysilane 2031-67-6, Methyltriethoxysilane 2487-90-3, Trimethoxysilane 2530-87-2, (3-Chloropropyl)trimethoxysilane 2553-19-7, Diphenyldiethoxysilane **2996-92-1**, Phenyltrimethoxysilane 4109-96-0, Dichlorosilane 4667-99-6, Chlorotriethoxysilane 4668-00-2, Chlorotrimethoxysilane 5089-70-3, (3-Chloropropyl)triethoxysilane 5926-26-1, (Chloromethyl)trimethoxysilane 6843-66-9, Diphenyldimethoxysilane 10025-78-2, Trichlorosilane 10026-04-7, Tetrachlorosilane 15267-95-5, (Chloromethyl)triethoxysilane 16336-69-9, 9-Anthracenecarboxylic acid sodium salt 18157-21-6, (2-Chloroethyl)trimethoxysilane 18279-67-9, (2-Chloroethyl)triethoxysilane 28106-60-7, (Chlorophenyl)triethoxysilane 71177-35-0, 9-Anthracenecarboxylic acid potassium salt 145611-68-3, (Chlorophenyl)trimethoxysilane 215320-92-6, 9-Phenanthrenecarboxylic acid potassium salt
RL: RCT (Reactant); RACT (Reactant or reagent)
(prepn. of silyl alkyl esters of anthracene and phenanthrene carboxylic acids as anti-**reflective** layers for **photolithog.** applications)
IT 313482-99-4P 639088-18-9P 639088-19-0P 639088-20-3P
RL: SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(prepn. of silyl alkyl esters of anthracene and phenanthrene carboxylic acids as anti-**reflective** layers for **photolithog.** applications)
IT 64-17-5, Ethanol, uses 67-56-1, Methanol, uses 67-63-0, 2-Propanol, uses 67-64-1, Acetone, uses 71-23-8, 1-Propanol, uses 97-64-3, Ethyl lactate 108-10-1, Methyl isobutyl ketone 109-60-4, Propyl acetate 123-42-2, Diacetone alcohol 141-78-6, Ethyl acetate, uses 1320-67-8, Methoxypropanol 7732-18-5, Water, uses 30136-13-1, Propoxypropanol 35296-72-1, Butanol
RL: NUU (Other use, unclassified); USES (Uses)
(solvent; prepn. of silyl alkyl esters of anthracene and phenanthrene carboxylic acids as anti-**reflective** layers for **photolithog.** applications)
REFERENCE COUNT: 5 THERE ARE 5 CITED REFERENCES AVAILABLE FOR

THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

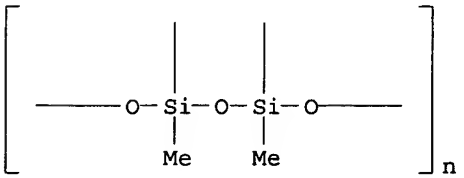
L30 ANSWER 7 OF 24 HCAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 2003:938959 HCAPLUS
DOCUMENT NUMBER: 139:398618
TITLE: Manufacture of **antireflective** material by sol-gel method and the material
INVENTOR(S): Suzuki, Tomoyuki; Ito, Arimichi
PATENT ASSIGNEE(S): Dai Nippon Printing Co., Ltd., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 13 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2003340844	A2	20031202	JP 2002-150124 <--	20020524
PRIORITY APPLN. INFO.:			JP 2002-150124 <--	20020524

AB The material is that having fine roughness for antireflection on the surface wherein the period of concaves and convexes forming the roughness and wavelength of visible light and shape of the cross section of the material regarding the concaves and convexes are regulated. The rough surface layer is formed by sol-gel method characterized by transfer of the concaves and convexes from a mold by stamping on the surface of a sol layer contg. organometallic compd., preferably methyltrimethoxysilane homopolymer. Preferably, the material is made of an inorg. substrate, which is fired after transfer of the shape on the surface. The mold, e.g., a Ni stamper, etc., is prepd. by electroplating on a mother mold obtained by **photolithog.**

IT **153315-80-1P**
RL: CPS (Chemical process); IMF (Industrial manufacture); PEP (Physical, engineering or chemical process); PYP (Physical process); PREP (Preparation); PROC (Process)
(sol-gel method after transfer of shape with roughness by stamping on surface layer made of)

RN 153315-80-1 HCAPLUS
CN Poly[(1,3-dimethyl-1,3:1,3-disiloxanediylidene)-1,3-bis(oxy)] (9CI) (CA INDEX NAME)



IC ICM B29C039-10
ICS B29C039-26; B32B007-02; G02B001-10; G02B005-02; G02F001-1335; B29L007-00; B29L011-00
CC 57-2 (Ceramics)
Section cross-reference(s): 38, 74
ST **antireflective** rough surface sol gel process; stamper

shape transfer sol gel process; glass substrate **antireflective** surface layer; methyltrimethoxysilane homopolymer stamping sol gel process; silica rough surface **antireflective** material

IT Sol-gel processing
Transfers
(formation of **antireflective** surface on material by sol-gel method after transfer of shape with roughness)

IT Polyesters, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(substrate; formation of **antireflective** surface on material by sol-gel method after transfer of shape with roughness)

IT 25498-03-7P, Methyltrimethoxysilane homopolymer **153315-80-1P**
RL: CPS (Chemical process); IMF (Industrial manufacture); PEP (Physical, engineering or chemical process); PYP (Physical process); PREP (Preparation); PROC (Process)
(sol-gel method after transfer of shape with roughness by stamping on surface layer made of)

IT 25038-59-9, PET (polyester), uses
RL: TEM (Technical or engineered material use); USES (Uses)
(substrate; formation of **antireflective** surface on material by sol-gel method after transfer of shape with roughness)

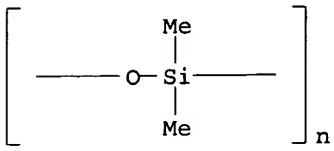
IT 7631-86-9, Silica, processes
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process)
(surface layer; formation of **antireflective** surface on material by sol-gel method after transfer of shape with roughness)

L30 ANSWER 8 OF 24 HCAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 2003:933379 HCAPLUS
DOCUMENT NUMBER: 140:261099
TITLE: Spatial light modulators based on micromachined **reflective** membranes on viscoelastic layers
AUTHOR(S): Sakarya, S.; Vdovin, G.; Sarro, P. M.
CORPORATE SOURCE: Laboratory of Electronic Instrumentation, Delft University of Technology, Delft, 2628 CD, Neth.
SOURCE: Sensors and Actuators, A: Physical (**2003**), A108(1-3), 271-275
CODEN: SAAPEB; ISSN: 0924-4247
PUBLISHER: Elsevier Science B.V.
DOCUMENT TYPE: Journal
LANGUAGE: English

AB Presented in this paper is a novel approach for the fabrication of low-cost integrated micromachined spatial light modulators based on electrostatic deformation of viscoelastic layers. The fabrication procedure is optimized so as to keep requirements on electronics and the mech. layers as low as possible. In approach, 2 Si chips are bonded together with an intermediate 5 μm viscoelastic layer in between. When the bulk Si of the top chip is etched away, a **reflective** surface results with very high optical quality. The top chip is coated with a 50. nm nitride layer to act as an etch stop and a 80. Nm Al layer for **reflectivity** and cond. When alternating potentials are applied on the electrode structure, the surface deforms in a sinusoidal shape, resulting in a phase grating, as verified exptl. Special low-stress etch holder technol. was developed for back and sidewall protection of the device and its contact pads. Applications lie in the field of projection displays, optical communication networks and optical **lithog.**

IT **9016-00-6**, Sylgard 527
RL: DEV (Device component use); USES (Uses)
(spatial light modulators based on micromachined **reflective** membranes on viscoelastic layers contg.)

RN 9016-00-6 HCAPLUS
CN Poly[oxy(dimethylsilylene)] (8CI, 9CI) (CA INDEX NAME)



CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
ST spatial modulator micromachined **reflective** membrane viscoelastic layer; Sylgard viscoelastic layer spatial modulator micromachined **reflective** membrane; silicon nitride spatial modulator micromachined membrane viscoelastic layer
IT Silicone rubber, uses
RL: DEV (Device component use); USES (Uses)
(di-Me; spatial light modulators based on micromachined **reflective** membranes on viscoelastic layers contg.)
IT Deformation (mechanical)
(electrostatic; spatial light modulators based on micromachined **reflective** membranes on viscoelastic layers with)
IT Membranes, nonbiological
Spatial light modulators
Viscoelastic materials
(spatial light modulators based on micromachined **reflective** membranes on viscoelastic layers)
IT 7429-90-5, Aluminum, uses 7440-21-3, Silicon, uses **9016-00-6**, Sylgard 527 12033-89-5, Silicon nitride si3n4, uses
RL: DEV (Device component use); USES (Uses)
(spatial light modulators based on micromachined **reflective** membranes on viscoelastic layers contg.)
REFERENCE COUNT: 8 THERE ARE 8 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L30 ANSWER 9 OF 24 HCAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 2003:912793 HCAPLUS
DOCUMENT NUMBER: 139:389744
TITLE: Method of forming dual damascene pattern using dual bottom anti-**reflective** coatings (BARC)
INVENTOR(S): Mukherjee-Roy, Moitreyee; Bliznetsov, Vladimir N.
PATENT ASSIGNEE(S): Institute of Microelectronics, Singapore
SOURCE: U.S. Pat. Appl. Publ., 8 pp.
CODEN: USXXCO
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 2003216026	A1	20031120	US 2002-146276	200205 15
			<--	
US 6743713	B2	20040601		
SG 106679	A1	20041029	SG 2003-1648	200303

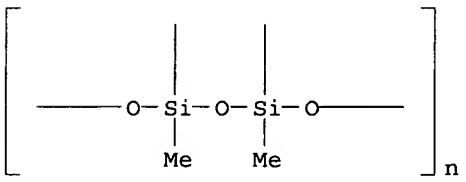
18
<--
PRIORITY APPLN. INFO.: US 2002-146276 A
200205
15
<--

AB The present invention relates generally to methods of forming dual damascene patterns and more particularly to methods of forming dual damascene patterns, without the use of etch stop layers, using dual bottom **antireflective** coating (BARC) films. A method of forming a via-first type dual damascene structure in the absence of an etch stop layer and without via-edge erosion or via-bottom punch-through is described. The invention uses 2 org. films deposited within via hole prior to trench etching. A via hole over a lower level metal line is 1st etched in the dielec. film. Two, preferably org., bottom **antireflective** coating (BARC) films, 1st 1 being the conformal type to coat the surfaces and the walls of the via and the 2nd 1 being the planarizing type to at least partially fill the via, are then deposited. Using a **mask** aligned to via hole, a wiring trench of desired depth is etched in the top portion of the dielec. film. During trench etching, the conformal BARC-1 film protects the via-edges from eroding and the planarizing BARC-2 film prevents punch-through of the via-bottom. Desired metal such as Al or Cu are deposited within the dual damascene pattern.

IT **153315-80-1**, Methyl silsesquioxane
RL: DEV (Device component use); USES (Uses)
(interlayer dielec.; method of forming dual damascene pattern using dual bottom anti-**reflective** coatings (BARC))

RN 153315-80-1 HCAPLUS

CN Poly[(1,3-dimethyl-1,3:1,3-disiloxanediylidene)-1,3-bis(oxy)] (9CI) (CA INDEX NAME)



IC ICM H01L021-4763
ICS H01L021-44; H01L021-469

INCL 438622000; 438638000; 438636000; 438643000; 438780000; 438687000

CC 76-3 (Electric Phenomena)

ST dual damascene interconnection bottom **antireflective** coating

IT Silsesquioxanes
RL: DEV (Device component use); USES (Uses)
(Me, interlayer dielec.; method of forming dual damascene pattern using dual bottom anti-**reflective** coatings (BARC))

IT **Antireflective** films
(bottom; method of forming dual damascene pattern using dual bottom anti-**reflective** coatings (BARC))

IT Interconnections, electric
(dual damascene; method of forming dual damascene pattern using dual bottom anti-**reflective** coatings (BARC))

IT Fluoropolymers, uses
Polyimides, uses
Silsesquioxanes
RL: DEV (Device component use); USES (Uses)
(interlayer dielec.; method of forming dual damascene pattern using dual bottom anti-**reflective** coatings (BARC))

IT Etching

Interconnections, electric
Semiconductor device fabrication
(method of forming dual damascene pattern using dual bottom anti-**reflective** coatings (BARC))

IT Foams
(nanofoams, interlayer dielec.; method of forming dual damascene pattern using dual bottom anti-**reflective** coatings (BARC))

IT Contact holes
(via holes; method of forming dual damascene pattern using dual bottom anti-**reflective** coatings (BARC))

IT 7631-86-9, Silica, uses 9002-84-0, PTFE 104133-11-1
116305-88-5, Silicon fluoride oxide **153315-80-1**, Methyl silsesquioxane 153315-81-2, Hydrogen silsesquioxane 182889-73-2
RL: DEV (Device component use); USES (Uses)
(interlayer dielec.; method of forming dual damascene pattern using dual bottom anti-**reflective** coatings (BARC))

L30 ANSWER 10 OF 24 HCAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 2003:777325 HCAPLUS
DOCUMENT NUMBER: 139:269279
TITLE: Method for manufacturing semiconductor device using dual-damascene techniques
INVENTOR(S): Nambu, Hidetaka
PATENT ASSIGNEE(S): Japan
SOURCE: U.S. Pat. Appl. Publ., 17 pp.
CODEN: USXXCO
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 2003186534	A1	20031002	US 2003-397784 <--	200303 26
JP 2003282704	A2	20031003	JP 2002-86954 <--	200203 26
CN 1447413	A	20031008	CN 2003-107534 <--	200303 26
PRIORITY APPLN. INFO.:			JP 2002-86954 A <--	200203 26

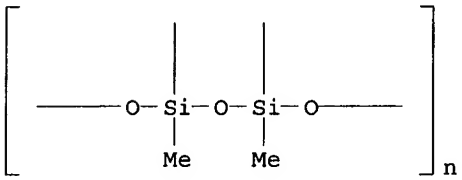
AB The present invention relates to a method for manufg. a semiconductor device using dual-damascene techniques and employing an inorg. and low dielec. const. film as an interlayer film used in formation of via, and particularly to a method for manufg. a semiconductor device employing an inorg./low dielec. const. film as an interlayer film used in formation of via and an org./low dielec. const. film as an interlayer film used in formation of interconnect line, those different films, i.e., inorg. and org. films, forming the hybrid configuration of insulation film in the semiconductor device. Formed on a substrate are an inorg. interlayer film, an org. interlayer film, a lower **mask** made of Si oxide and an upper **mask** made of Si nitride in this order. An opening is formed in the upper **mask**. Then, a cover **mask** made of Si oxynitride and having a film thickness of 20-100 nm is formed on the upper **mask**. Thereafter, an anti-reflection

coating film and a resist film are formed thereon. Subsequently, the anti-reflection coating film, the cover **mask** and the lower **mask** is etched using the resist film as a **mask**. Then, the org. interlayer film and the inorg. interlayer film are etched using the cover **mask** as a **mask** to form a via hole. Simultaneously, the cover **mask** is removed to make the upper **mask** exposed. Thereafter, the org. interlayer film is etched using the upper **mask** as a **mask** to form an interconnect trench.

IT **153315-80-1**, Methyl silsesquioxane
RL: TEM (Technical or engineered material use); USES (Uses)
(**mask** layer, interlayer dielec.; method for manufg. semiconductor device using dual-damascene techniques)

RN 153315-80-1 HCAPLUS

CN Poly[(1,3-dimethyl-1,3:1,3-disiloxanediylidene)-1,3-bis(oxy)] (9CI) (CA INDEX NAME)



IC ICM H01L021-4763
INCL 438633000; 438634000
CC 76-3 (Electric Phenomena)

IT Silsesquioxanes
RL: TEM (Technical or engineered material use); USES (Uses)
(Me, **mask** layer, interlayer dielec.; method for manufg. semiconductor device using dual-damascene techniques)

IT Silsesquioxanes
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
(hydrogen, **mask** layer; method for manufg. semiconductor device using dual-damascene techniques)

IT Silsesquioxanes
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
(**mask** layer; method for manufg. semiconductor device using dual-damascene techniques)

IT **Antireflective** films
Dielectric films
Etch stops
Etching
Interconnections, electric
Semiconductor device fabrication
(method for manufg. semiconductor device using dual-damascene techniques)

IT 7631-86-9, Silica, uses
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
(**mask** layer, interlayer dielec.; method for manufg. semiconductor device using dual-damascene techniques)

IT **153315-80-1**, Methyl silsesquioxane
RL: TEM (Technical or engineered material use); USES (Uses)
(**mask** layer, interlayer dielec.; method for manufg. semiconductor device using dual-damascene techniques)

IT 153315-81-2, Hydrogen silsesquioxane 182889-73-2
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
(**mask** layer; method for manufg. semiconductor device using dual-damascene techniques)

IT 95-71-6, Methyl hydroquinone 409-21-2, Silicon carbide (SiC), uses
7440-33-7, Tungsten, uses 11105-01-4, Silicon nitride oxide
12033-89-5, Silicon nitride, uses 12627-41-7, Tungsten silicide
64477-28-7, Silicon carbide nitride 116305-88-5, Silicon fluoride oxide
RL: TEM (Technical or engineered material use); USES (Uses)
(**mask** layer; method for manufg. semiconductor device using dual-damascene techniques)

L30 ANSWER 11 OF 24 HCAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 2002:533965 HCAPLUS
DOCUMENT NUMBER: 137:101418
TITLE: **Antireflective** silicon-containing compositions as hard **mask** layer
INVENTOR(S): Angelopoulos, Marie; Aviram, Ari; Guarnieri, C. Richard; Huang, Wu-song; Kwong, Ranee; Moreau, Wayne M.
PATENT ASSIGNEE(S): International Business Machines Corporation, USA
SOURCE: U.S., 6 pp.
CODEN: USXXAM
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

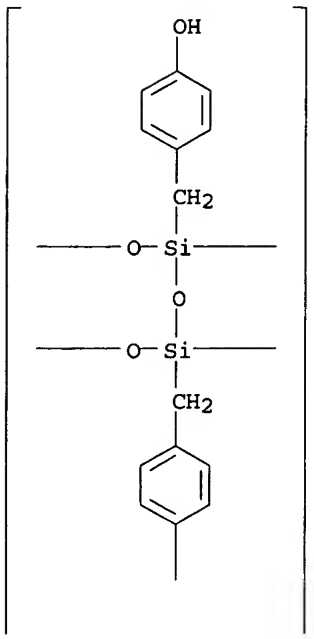
PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 6420088	B1	20020716	US 2000-602967 <--	20000623
US 2002187422	A1	20021212	US 2002-165582 <--	20020607
US 6503692	B2	20030107		
PRIORITY APPLN. INFO.:			US 2000-602967 A3 <--	20000623

AB **Antireflective** compns. characterized by the presence of an SiO-contg. polymer having pendant chromophore moieties are useful **antireflective** coating/hard **mask** compns. in **lithog.** processes. These compns. provide outstanding optical, mech. and etch selectivity properties while being applicable using spin-on application techniques. The compns. are esp. useful in **lithog.** processes used to configure underlying material layers on a substrate, esp. metal or semiconductor layers.

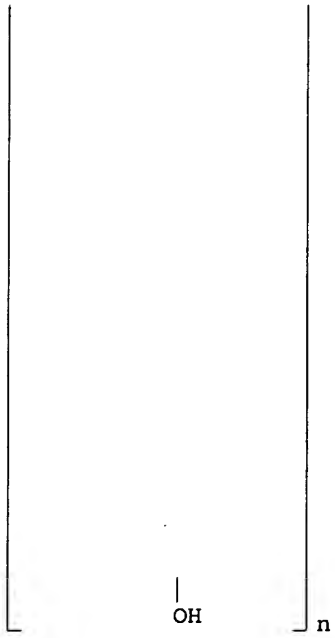
IT **188629-68-7P**
RL: SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(**antireflective** silicon-contg. compns. as hard **mask** layer contg.)

RN 188629-68-7 HCAPLUS
CN Poly[[1,3-bis[(4-hydroxyphenyl)methyl]-1,3:1,3-disiloxanediylidene]-1,3-bis(oxy)] (9CI) (CA INDEX NAME)

PAGE 1-A



PAGE 2-A



IC ICM G03C001-825
ICS G03C001-835; G08G077-16; G08G077-24; G08G077-26; G08G077-04
INCL 430272100
CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)
Section cross-reference(s): 38
ST **lithog antireflective** hard **mask**

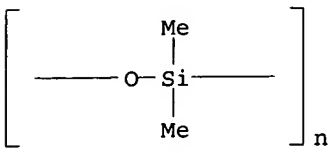
silsesquioxane
IT **Antireflective** films
Lithography
(**antireflective** silicon-contg. compns. as hard **mask** layer)
IT Silsesquioxanes
RL: TEM (Technical or engineered material use); USES (Uses)
(**antireflective** silicon-contg. compns. as hard **mask** layer contg.)
IT 17464-88-9D, Tetramethoxymethyl glycoluril, Methylphenyl deriv
RL: TEM (Technical or engineered material use); USES (Uses)
(Powderlink; **antireflective** silicon-contg. compns. as hard **mask** layer contg.)
IT 155918-47-1, Nitrobenzyl tosylate
RL: TEM (Technical or engineered material use); USES (Uses)
(acid generator; **antireflective** silicon-contg. compns. as hard **mask** layer contg.)
IT 1468-95-7DP, 9-Anthracene methanol, reaction product with poly(4-hydroxybenzylsilsesquioxane) 188557-77-9DP, 4-Hydroxybenzylsilanetriol homopolymer, reaction product with anthracene methanol **188629-68-7P**
RL: SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(**antireflective** silicon-contg. compns. as hard **mask** layer contg.)
REFERENCE COUNT: 18 THERE ARE 18 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L30 ANSWER 12 OF 24 HCAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 2002:443822 HCAPLUS
DOCUMENT NUMBER: 137:192694
TITLE: Technology of **reflective** membranes for spatial light modulators
AUTHOR(S): Sakarya, S.; Vdovin, G.; Sarro, P. M.
CORPORATE SOURCE: Laboratory of Electronic Instrumentation, Delft University of Technology, Delft, 2628 CD, Neth.
SOURCE: Sensors and Actuators, A: Physical (**2002**), A97-98, 468-472
CODEN: SAAPEB; ISSN: 0924-4247
PUBLISHER: Elsevier Science S.A.
DOCUMENT TYPE: Journal
LANGUAGE: English
AB This paper describes the fabrication technol. of two different implementations of a spatial light modulator. Both implementations are based on continuous **reflective** membranes that are deformed electrostatically by potentials applied on an underlying electrode structure. By using a continuous membrane the authors achieved a 100% optical fill factor. Addnl., the membrane can be coated with any metal, enabling it to use a uniform technol. to fabricate devices able to handle a high optical load over a wide spectral range. The first implementation is based on a continuous thin nitride membrane that rests on a support grid structure, which subdivides the membrane into individually controllable pixels. The second implementation uses viscoelastic layers as a carrier material for the **reflective** membrane, making the device more robust, enabling a high resoln., but a slower speed of response. Expts. with fabricated devices have shown sufficient deflection at low control voltages, making the use of integrated electronics possible. Applications for these devices include projection displays, optical information processing systems, optical **lithog.**, etc.
IT **9016-00-6**, Sylgard 527
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process); USES (Uses)

(Sylgard 527; fabrication technol. using curvature modulation for **reflective** projection displays using two different implementations of spatial light modulator in relation to)

RN 9016-00-6 HCAPLUS

CN Poly[oxy(dimethylsilylene)] (8CI, 9CI) (CA INDEX NAME)



CC 74-13 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)
Section cross-reference(s): 73

ST **reflective** membrane display spatial light modulator

IT Polysiloxanes, processes
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process); USES (Uses)
(Sylgard 527; fabrication technol. using curvature modulation for **reflective** projection displays using two different implementations of spatial light modulator in relation to)

IT Micromachining
Spatial light modulators
(fabrication technol. using curvature modulation for **reflective** projection displays using two different implementations of spatial light modulator)

IT Optical imaging devices
Projection apparatus
(fabrication technol. using curvature modulation for **reflective** projection displays using two different implementations of spatial light modulator in relation to)

IT **9016-00-6**, Sylgard 527 31900-57-9
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process); USES (Uses)
(Sylgard 527; fabrication technol. using curvature modulation for **reflective** projection displays using two different implementations of spatial light modulator in relation to)

IT 1310-58-3, Potassium hydroxide, uses
RL: NUU (Other use, unclassified); USES (Uses)
(etching agent; fabrication technol. using curvature modulation for **reflective** projection displays using two different implementations of spatial light modulator in relation to)

IT 7440-21-3, Silicon, processes
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process); USES (Uses)
(fabrication technol. using curvature modulation for **reflective** projection displays using two different implementations of spatial light modulator)

IT 7429-90-5, Aluminum, processes
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process); USES (Uses)
(fabrication technol. using curvature modulation for **reflective** projection displays using two different implementations of spatial light modulator in relation to)

IT 12033-89-5, Silicon nitride, processes
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process); USES (Uses)

(membrane; fabrication technol. using curvature modulation for **reflective** projection displays using two different implementations of spatial light modulator)

REFERENCE COUNT: 5 THERE ARE 5 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L30 ANSWER 13 OF 24 HCAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 2002:405817 HCAPLUS
DOCUMENT NUMBER: 136:393287
TITLE: Method of depositing organosilicate layers
INVENTOR(S): Yieh, Elli; Gaillard, Frederic; Xia, Li-Qun
PATENT ASSIGNEE(S): Applied Materials, Inc., USA
SOURCE: Eur. Pat. Appl., 17 pp.
CODEN: EPXXDW
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

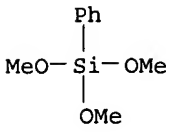
PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 1209728	A2	20020529	EP 2001-124607	200110 15
			<--	
EP 1209728	A3	20041027		
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR				
US 6500773	B1	20021231	US 2000-723886	200011 27
			<--	
TW 552308	B	20030911	TW 2001-90125612	200110 16
			<--	
SG 102010	A1	20040227	SG 2001-6411	200110 18
			<--	
JP 2002235172	A2	20020823	JP 2001-361102	200111 27
			<--	
PRIORITY APPLN. INFO.:			US 2000-723886 A	200011 27
			<--	

OTHER SOURCE(S): MARPAT 136:393287

AB The present invention relates to a method of forming organosilicate thin film. The organosilicate layer is formed by reacting a gas mixt. comprising a phenyl-based alkoxysilane compd. The gas mixt. may be reacted by applying an elec. field to it. The gas mixt. may optionally include an organosilane compd. as well as an oxidizing gas. The organosilicate layer is used in integrated circuit fabrication processes as an **antireflective** coating, or used as a hard **mask**, or incorporated into a damascone structure.

IT **2996-92-1**, Phenyltrimethoxysilane
RL: TEM (Technical or engineered material use); USES (Uses)
(depositing organosilicate layers for integrated circuit fabrication processes contg.)

RN 2996-92-1 HCAPLUS
CN Silane, trimethoxyphenyl- (6CI, 7CI, 8CI, 9CI) (CA INDEX NAME)



IC ICM H01L021-312
CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)
Section cross-reference(s): 42, 76
ST photoresist **antireflective** coating hard **mask**
IT **Antireflective** films
(depositing organosilicate layers for integrated circuit fabrication processes as)
IT 75-76-3, Tetramethylsilane 78-62-6, Dimethyldiethoxysilane 107-46-0, Hexamethyldisiloxane 617-86-7, Triethylsilane 780-69-8, Phenyltriethoxysilane 992-94-9, Methylsilane 993-07-7, Trimethylsilane 1111-74-6, Dimethylsilane 1112-39-6, Dimethyldimethoxysilane 2171-96-2, Methoxysilane 2553-19-7, Diphenyldiethoxysilane **2996-92-1**, Phenyltrimethoxysilane 5021-93-2, Diethyldiethoxysilane 5654-05-7, Bis(methylsilano)methane 6843-66-9, Diphenyldimethoxysilane
RL: TEM (Technical or engineered material use); USES (Uses)
(depositing organosilicate layers for integrated circuit fabrication processes contg.)

L30 ANSWER 14 OF 24 HCAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 2002:290765 HCAPLUS
DOCUMENT NUMBER: 136:302790
TITLE: Method of making a via filled dual damascene structure without middle stop layer in semiconductor device fabrication
INVENTOR(S): Wang, Fei; Okada, Lynne A.; Subramanian, Ramkumar; Gabriel, Calvin T.
PATENT ASSIGNEE(S): Advanced Micro Devices, Inc., USA
SOURCE: U.S., 11 pp.
CODEN: USXXAM
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 6372631	B1	20020416	US 2001-778061	20010207

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PRIORITY APPLN. INFO.: US 2001-778061 20010207

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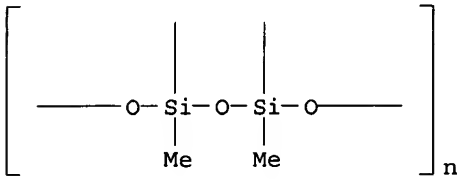
AB Method of making a via filled dual damascene structure without middle stop layer in semiconductor device fabrication is claimed. An interconnect structure and method of forming the same in which a diffusion barrier layer/etch stop layer is deposited over a conductive layer. An inorg. low k dielec. material is deposited over the barrier diffusion layer/etch stop layer to form a 1st dielec. layer. The 1st dielec. layer is etched to form a via in the 1st dielec. layer. An org. low k dielec. material is deposited within the via and over the 1st dielec. layer to form a 2nd dielec. layer over the via and the 1st dielec. layer. The re-filled via is

simultaneously etched with the 2nd dielec. layer in which a trench is formed. A portion of the trench is directly over the via. The reopened via and the trench are filled with a conductive material.

IT **153315-80-1**, Methylsilsesquioxane
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process); USES (Uses)
(method of making via filled dual damascene structure without middle stop layer in semiconductor device fabrication)

RN 153315-80-1 HCAPLUS
CN Poly[(1,3-dimethyl-1,3:1,3-disiloxanediylidene)-1,3-bis(oxy)] (9CI) (CA INDEX NAME)



IC ICM H01L021-4763
INCL 438624000
CC 76-3 (Electric Phenomena)
IT **Antireflective** films
Dielectric films
Diffusion barrier
Etching
Interconnections, electric
Photolithography
(method of making via filled dual damascene structure without middle stop layer in semiconductor device fabrication)

IT 7440-50-8, Copper, processes 7631-86-9, Silicon dioxide, processes 9002-84-0, Teflon 139196-38-6, Polybenzocyclobutene **153315-80-1**, Methylsilsesquioxane 153315-81-2, Hydrogen silsesquioxane 203945-07-7, SiLK 213329-13-6, FLARE 2.0 405271-97-8, Nautilus
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process); USES (Uses)
(method of making via filled dual damascene structure without middle stop layer in semiconductor device fabrication)

REFERENCE COUNT: 8 THERE ARE 8 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L30 ANSWER 15 OF 24 HCAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 2001:355502 HCAPLUS
DOCUMENT NUMBER: 135:99725
TITLE: Application of Polysilanes to LSI Manufacturing Processes-Their **Antireflective** Properties and Etching Selectivity toward Resists
AUTHOR(S): Hayase, S.; Nakano, Y.; Yoshikawa, S.; Ohta, H.; Sato, Y.; Shiobara, E.; Miyoshi, S.; Onishi, Y.; Abe, M.; Matsuyama, H.; Ohiwa, Y.
CORPORATE SOURCE: Research and Development Center, Toshiba Corporation, Komukai-toshiba-cho Saiwai-ku Kawasaki, 210, Japan
SOURCE: Chemistry of Materials (**2001**), 13(6), 2186-2194
CODEN: CMATEX; ISSN: 0897-4756
PUBLISHER: American Chemical Society
DOCUMENT TYPE: Journal

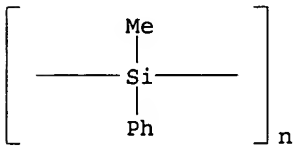
LANGUAGE: English

AB Fundamental aspects for a novel LSI pattern fabrication process employing polysilanes as an **antireflective** layer (ARL) are discussed. The multilayer is composed of an org. resist, a polysilane layer, and a substrate. The polysilane avoids reflections from the substrate when the resist is exposed to 248-nm light emitted from a KrF excimer laser. It also acts as a pattern transfer layer. The polysilane layer is etched faster than the resist when the etching is carried out with reactive ions by employing Cl2 gas. Therefore, the resist pattern is transferred to the polysilane layer precisely. The relationship between the structure of the polysilane and its phys. properties, namely, the UV absorbance at 248 nm and etching selectivity toward the org. resist, is discussed and the best polysilane structure for this application identified. Attention, during synthesis of polysilanes there is a danger of explosion. The reaction vessel must be maintained under inert conditions, monomers should be added slowly to the reaction mixt. under controlled conditions, care should be taken specially at the beginning of the reaction which has an induction period.

IT **76188-55-1**, Dichloromethylphenylsilane homopolymer, sru
RL: PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(polysilanes and their **antireflective**- and etching properties in **photolithog.** imaging)

RN 76188-55-1 HCAPLUS

CN Poly(methylphenylsilylene) (9CI) (CA INDEX NAME)



CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)

ST **photolithog** polysilane antireflection etching property safety

IT Formation enthalpy
Molecular orbital
(heat of formation of polysilanes model compds. in relation to etching behavior of polysilane **antireflective** layers in **photolithog.**)

IT Etching
(plasma, selectivity; polysilanes and their **antireflective**- and etching properties in **photolithog.** imaging)

IT **Antireflective** films
Molecular structure-property relationship
Photoresists
UV absorption
UV and visible spectra
(polysilanes and their **antireflective**- and etching properties in **photolithog.** imaging)

IT Polysilanes
RL: PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(polysilanes and their **antireflective**- and etching properties in **photolithog.** imaging)

IT 56087-10-6 79991-69-8 349079-32-9 349079-33-0
RL: PRP (Properties); RCT (Reactant); RACT (Reactant or reagent)
(MO calcns. of heat of formation of org. resist model compds. in relation to etching behavior of polysilane **antireflective** layers in **photolithog.**)

IT 5181-42-0 18026-87-4 118714-41-3 127348-36-1
RL: PRP (Properties); RCT (Reactant); RACT (Reactant or reagent)
(MO calcns. of heat of formation of polysilanes model compds. in relation to etching behavior of polysilane **antireflective** layers in **photolithog.**)
IT 7782-50-5, Chlorine, processes
RL: PEP (Physical, engineering or chemical process); PROC (Process)
(plasma etching; polysilanes and their **antireflective**- and etching properties in **photolithog.** imaging)
IT 212334-44-6P, 1,2-Bis(dichloromethylsilyl)ethane-dichlorodiphenylsilane copolymer 349079-27-2P 349079-28-3P 349079-30-7P
RL: PRP (Properties); SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(polysilanes and their **antireflective**- and etching properties in **photolithog.** imaging)
IT 31324-77-3, Dichloromethylphenylsilane homopolymer 70158-17-7, Dichlorodimethylsilane-methylphenyldichlorosilane copolymer **76188-55-1**, Dichloromethylphenylsilane homopolymer, sru 80731-82-4, Poly(phenylsilane) 95584-36-4, Poly(phenylsilane), sru 98387-81-6, Dichloromethylphenylsilane-dichlorodiphenylsilane copolymer
RL: PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(polysilanes and their **antireflective**- and etching properties in **photolithog.** imaging)
IT 56-23-5, Carbon tetrachloride, properties 1605-73-8, tert-Butyl radical 52168-45-3
RL: FMU (Formation, unclassified); PRP (Properties); FORM (Formation, nonpreparative)
(product; MO calcns. of heat of formation of org. resist model compds. in relation to etching behavior of polysilane **antireflective** layers in **photolithog.**)
IT 2396-01-2, Phenyl 10026-04-7, Tetrachlorosilane 16571-41-8, Trimethylsilyl 349079-31-8
RL: FMU (Formation, unclassified); PRP (Properties); FORM (Formation, nonpreparative)
(product; MO calcns. of heat of formation of polysilanes model compds. in relation to etching behavior of polysilane **antireflective** layers in **photolithog.**)
REFERENCE COUNT: 63 THERE ARE 63 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L30 ANSWER 16 OF 24 HCAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 2000:223696 HCAPLUS
DOCUMENT NUMBER: 132:243894
TITLE: Silver halide photographic plate for **photomask** and processing of the same
INVENTOR(S): Moriya, Tomonobu
PATENT ASSIGNEE(S): Konica Co., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 12 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2000098538	A2	20000407	JP 1998-269844	19980924

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PRIORITY APPLN. INFO.: JP 1998-269844

199809
24
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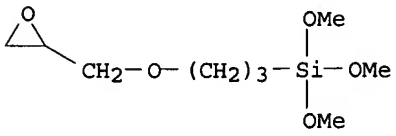
AB The title photog. plate comprises at least 1 photog. emulsion layer on a glass support, wherein the photog. emulsion layer comprises Ag halide grains with an av. particle size of 0.08-0.2 μm, reducing fog agents, and Rh-, Ir- and/or Os-contg. compds. and the photog. plate shows 0.8-1.8 **reflectivity** at 365 nm. The photog. plate is processed with an developer contg. specified developing agents.

IT **2530-83-8**
RL: DEV (Device component use); USES (Uses)
(coupling agent in Ag halide photog. plate for **photomask**)

RN 2530-83-8 HCAPLUS

CN Silane, trimethoxy[3-(oxiranylmethoxy)propyl]- (9CI) (CA INDEX NAME)



IC ICM G03C001-76
ICS G03C001-035; G03C001-09; G03C005-29

CC 74-2 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)

ST silver halide photog plate **photomask** development developer

IT Photographic development
Photographic emulsions
Photographic plates
Photomasks (**lithographic masks**)
(Ag halide photog. plate for **photomask** and processing of the same)

IT **2530-83-8** 65380-84-9
RL: DEV (Device component use); USES (Uses)
(coupling agent in Ag halide photog. plate for **photomask**)

IT 7439-88-5, Iridium, uses 7440-04-2, Osmium, uses 7440-16-6, Rhodium, uses
RL: MOA (Modifier or additive use); USES (Uses)
(in photog. emulsion layer of Ag halide photog. plate for **photomask**)

IT 9011-14-7, Poly(methyl methacrylate)
RL: DEV (Device component use); USES (Uses)
(matting agent in Ag halide photog. plate for **photomask**)

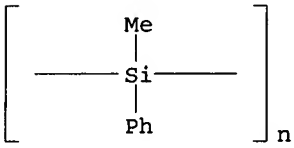
IT 1758-73-2, Thiourea dioxide
RL: DEV (Device component use); USES (Uses)
(reducing fog agent in Ag halide photog. plate for **photomask**)

L30 ANSWER 17 OF 24 HCAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 1999:467479 HCAPLUS
DOCUMENT NUMBER: 131:229701
TITLE: Polysilane anti-**reflective** layer for deep UV **lithography**
AUTHOR(S): Sato, Yasuhiko; Miyoshi, Seiro; Matsuyama, Hideto; Onishi, Yasunobu; Nakano, Yoshihiko; Hayase, Shuji
CORPORATE SOURCE: Microelectronics Engineering Laboratory, Toshiba Corporation, Yokohama, 235-8522, Japan
SOURCE: Journal of Photopolymer Science and Technology (

1999), 12(4), 663-668
CODEN: JSTEEW; ISSN: 0914-9244
PUBLISHER: Technical Association of Photopolymers, Japan
DOCUMENT TYPE: Journal
LANGUAGE: English

AB Bottom anti-**reflective** layer (ARL) is essential for deep UV **lithog.** in order to reduce the crit. dimension (CD) variations caused by reflection. We have newly applied polysilane for spin-coated ARL which can be etched much faster than resist. This ARL process is named the polysilane anti-**reflective** layer (PSARL) process. Poly(diphenylsilane), poly(phenylmethylsilane), and copolymer of these polysilanes are evaluated with a view to their application as ARL materials and the results obtained are presented in this paper. Characteristics of PSARL made of poly(diphenylsilane-co-phenylmethylsilane) with the optimized copolymer ratio are as follows. The refractive index for PSARL at 248 nm is n=2.05, k=0.29, and PSARL can act as the anti-**reflective** layer for KrF excimer laser **lithog.** A good resist profile is achieved without any footing and residue on PSARL. It can be etched 2.05 times faster than the resist and vertically etched using resist pattern as the etch **mask.** The PSARL process realizes thin resist process and enlarges **lithog.** process window.

IT **76188-55-1**, Dichloromethylphenylsilane homopolymer, sru
RL: TEM (Technical or engineered material use); USES (Uses)
(polysilane anti-**reflective** layer for deep UV **lithog.**)
RN 76188-55-1 HCAPLUS
CN Poly(methylphenylsilylene) (9CI) (CA INDEX NAME)



CC 38-3 (Plastics Fabrication and Uses)
Section cross-reference(s): 37, 74
ST polysilane **antireflective** layer deep UV **lithog**
IT **Photolithography**
(UV; polysilane anti-**reflective** layer for deep UV **lithog.**)
IT **Antireflective** films
Glass transition temperature
Photoresists
Refractive index
(polysilane anti-**reflective** layer for deep UV **lithog.**)
IT Polysilanes
RL: TEM (Technical or engineered material use); USES (Uses)
(polysilane anti-**reflective** layer for deep UV **lithog.**)
IT 29386-52-5, Dichlorodiphenylsilane homopolymer 31324-77-3, Dichloromethylphenylsilane homopolymer 51176-28-4, Dichlorodiphenylsilane homopolymer, sru **76188-55-1**, Dichloromethylphenylsilane homopolymer, sru 98387-81-6, Dichlorodiphenylsilane-dichloromethylphenylsilane copolymer
RL: TEM (Technical or engineered material use); USES (Uses)
(polysilane anti-**reflective** layer for deep UV **lithog.**)
REFERENCE COUNT: 11 THERE ARE 11 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L30 ANSWER 18 OF 24 HCAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 1998:476321 HCAPLUS
DOCUMENT NUMBER: 129:181994
TITLE: Etch selectivity of 4SiMA:hydroxystyrene based copolymers. Silicon chemistry for bilayer resist systems
AUTHOR(S): Wallraff, G. M.; Larson, C. E.; Sooriyakumaran, R.; Oppitz, J.; Fenzel-Alexander, D.; DiPietro, R.; Hofer, D.; Breyta, G.; Sherwood, M.; Muete, J.; Lin, Q.; LaTulip, D.; Simons, J.; Babich, K.; Petrillo, K.; Angelopoulos, M.
CORPORATE SOURCE: IBM Almaden Res. Cent., San Jose, CA, 95120, USA
SOURCE: Journal of Photopolymer Science and Technology (**1998**), 11(4), 673-680
CODEN: JSTEEW; ISSN: 0914-9244
PUBLISHER: Technical Association of Photopolymers, Japan
DOCUMENT TYPE: Journal
LANGUAGE: English

AB Thin film imaging resists (TSI and Bilayer systems) confine the imaging to a thin resist film (in the case of a bilayer system) which is subsequently transferred to a thicker polymeric underlayer. This approach has a no. of potential advantages including increased ability to print high aspect ratios at small feature sizes, better resoln. at a given depth of focus (DOF), and minimization of resist substrate interactions including resist "footing," standing over wave formation and **reflective** notching caused by topog. Continued progress in single layer resist technol. has been able to meet the current manufg. requirements and the more complex TSI approaches have not yet been required. However, the requirements for imaging features below below 0.18 μ, the desire to extend high NA 248 nm exposure technol. and anticipated shift to 193 nm exposure tools has led to renewed interest in thin film imaging approaches. In this report we will describe new chem. developed for bi layer resist systems for use at 248 nm in both pos. and neg. tone.

IT **188629-68-7P**, p-Hydroxybenzylsilanetriol homopolymer, ladder sru
RL: PNU (Preparation, unclassified); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(etch selectivity of 4SiMA:hydroxystyrene based copolymers)
RN 188629-68-7 HCAPLUS
CN Poly[[1,3-bis[(4-hydroxyphenyl)methyl]-1,3:1,3-disiloxanediylidene]-1,3-bis(oxy)] (9CI) (CA INDEX NAME)

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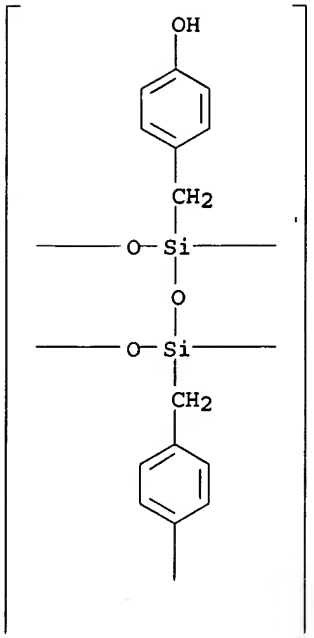
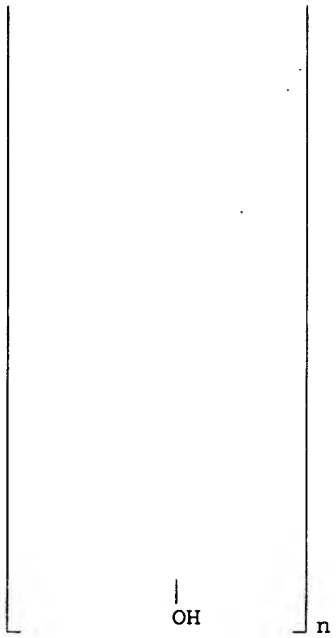




PAGE 2-A

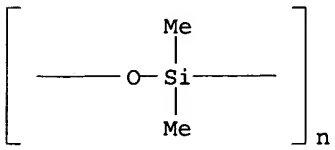
CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)

IT **Photolithography**
(submicron; etch selectivity of 4SiMA:hydroxystyrene based copolymers)

IT 188557-77-9P, p-Hydroxybenzylsilanetriol homopolymer
188629-68-7P, p-Hydroxybenzylsilanetriol homopolymer, ladder

sru 211369-54-9P
RL: PNU (Preparation, unclassified); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(etch selectivity of 4SiMA:hydroxystyrene based copolymers)
REFERENCE COUNT: 17 THERE ARE 17 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L30 ANSWER 19 OF 24 HCAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 1998:96671 HCAPLUS
DOCUMENT NUMBER: 128:160899
TITLE: **Photolithography** with transparent **reflective photomasks**
AUTHOR(S): Qin, Dong; Xia, Younan; Black, Andrew J.; Whitesides, George M.
CORPORATE SOURCE: Department of Chemistry and Chemical Biology, Harvard University, Cambridge, MA, 02138, USA
SOURCE: Journal of Vacuum Science & Technology, B: Microelectronics and Nanometer Structures (**1998**), 16(1), 98-103
CODEN: JVTBD9; ISSN: 0734-211X
PUBLISHER: American Institute of Physics
DOCUMENT TYPE: Journal
LANGUAGE: English
AB A new type of **photomask** was fabricated by casting a prepolymer of a transparent, elastomeric polymer (polydimethylsiloxane, PDMS) against a Si(100) master whose surface was patterned with V-shaped trenches or pyramidal pits using anisotropic etching. The PDMS replica, when placed in contact with a film of photoresist and illuminated, acts as a **photomask** . The sidewalls of the trenches and pits in the Si master meet with the plateaus in dihedral angles of 54°; as a result, the PDMS replica selectively blocks the incident light in regions where it has sloping features by total internal reflection, and acts as a **reflective** contact **mask** for **photolithog.** The feasibility of this new type of **photomask** was demonstrated by the fabrication of micropatterns in photoresist (and in an underlying Si substrate) with smaller feature sizes and higher complexities than those present on the original chrome **mask** used in patterning the Si master. The patterns produced using these elastomeric **photomasks** can be changed by varying the pressure applied in contacting them.
IT **9016-00-6**, Poly(dimethylsiloxane)
RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(**photolithog.** with transparent **reflective photomasks**)
RN 9016-00-6 HCAPLUS
CN Poly[oxy(dimethylsilylene)] (8CI, 9CI) (CA INDEX NAME)



CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)
ST dimethylsiloxane polymer silicon Microposit 1805 photoresist; **photolithog** transparent **reflective photomask**
IT Silicone rubber, processes

RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(di-Me, Sylgard 184; **photolithog.** with transparent **reflective photomasks**)

IT Polysiloxanes, processes
RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(di-Me; **photolithog.** with transparent **reflective photomasks**)

IT **Photomasks (lithographic masks)**
(photo; **photolithog.** with transparent **reflective photomasks**)

IT Etching
Photolithography
Photoresists
(**photolithog.** with transparent **reflective photomasks**)

IT 7440-22-4, Silver, processes 7440-32-6, Titanium, processes 201168-03-8, S 1805
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(**photolithog.** with transparent **reflective photomasks**)

IT 7440-21-3, Silicon, processes **9016-00-6**, Poly(dimethylsiloxane) 31900-57-9, Poly(dimethylsiloxane)
RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(**photolithog.** with transparent **reflective photomasks**)

REFERENCE COUNT: 20 THERE ARE 20 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L30 ANSWER 20 OF 24 HCAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 1997:506608 HCAPLUS
DOCUMENT NUMBER: 127:137166
TITLE: Coating compositions having anti-**reflective** and anti-fogging properties useful for disposable surgical **masks** and face shields
INVENTOR(S): Scholz, Matthew T.; Kausch, William L.
PATENT ASSIGNEE(S): Minnesota Mining and Manufacturing Company, USA
SOURCE: PCT Int. Appl., 56 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 9723571	A1	19970703	WO 1996-US18986	199611 27

<--

W: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, HU, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, TJ, TM, TR, TT, UA, UG, UZ, VN, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM
RW: KE, LS, MW, SD, SZ, UG, AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG

CA 2239132	AA	19970703	CA 1996-2239132	199611

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AU 9711248	A1	19970717	AU 1997-11248	
				199611
				27
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AU 707108	B2	19990701		
EP 868489	A1	19981007	EP 1996-942082	
				199611
				27
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EP 868489	B1	20001018		
R: DE, ES, FR, GB, IT				
JP 2000503050	T2	20000314	JP 1997-523647	
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ES 2151190	T3	20001216	ES 1996-942082	
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ZA 9610429	A	19980611	ZA 1996-10429	
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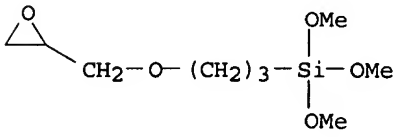
PRIORITY APPLN. INFO.:			US 1995-576255	A
				199512
				21
			<--	
			WO 1996-US18986	W
				199611
				27
			<--	

AB The title compns. utilizes an inorg. metal oxide (e.g., silica) in combination with surfactants having hydrophilic group(s) and hydrophobic group(s), wherein the hydrophilic groups are chosen from pyrrolidone and polyhydroxy group with ≥2 hydroxy groups sepd. by ≤5 atoms (no. of OH groups ≥ total no. of the hydrophobic groups present in the surfactant mol.), and the hydrophobic group is a C≥4 hydrocarbon chain or C≥3 perfluorinated radical; the compns. coated at least one side of a transparent substrate show a drop diam. ≥4 mm in wetting test and provide the substrate ≥3% higher transmission of 550 nm light. The coating compns. are particularly useful in the manuf. of disposable surgical **masks** and face shields.

IT **2530-83-8**, A 187
RL: MOA (Modifier or additive use); USES (Uses)
(coupler; coating compns. having anti-**reflective** and anti-fogging properties useful for disposable surgical **masks** and face shields)

RN 2530-83-8 HCAPLUS

CN Silane, trimethoxy[3-(oxiranylmethoxy)propyl]- (9CI) (CA INDEX NAME)



IC ICM C09D001-00
ICS C09D005-00; C09K003-18

CC 42-10 (Coatings, Inks, and Related Products)

ST antifogging **antireflective** coating surgical **mask**

; face shield antifogging **antireflective** coating; silica surfactant antifogging **antireflective** coating

IT **Antireflective** films
(coating compns. having anti-**reflective** and anti-fogging properties useful for disposable surgical **masks** and face shields)

IT Polyesters, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(coating compns. having anti-**reflective** and anti-fogging properties useful for disposable surgical **masks** and face shields)

IT Antifogging agents
(coatings; coating compns. having anti-**reflective** and anti-fogging properties useful for disposable surgical **masks** and face shields)

IT Medical goods
Medical goods
(face **masks**; coating compns. having anti-**reflective** and anti-fogging properties useful for disposable surgical **masks** and face shields)

IT Shields
(face; coating compns. having anti-**reflective** and anti-fogging properties useful for disposable surgical **masks** and face shields)

IT 76009-37-5, Hexaglycerin dioleate
RL: TEM (Technical or engineered material use); USES (Uses)
(Caprol 6G2O; coating compns. having anti-**reflective** and anti-fogging properties useful for disposable surgical **masks** and face shields)

IT 34424-97-0, Hexaglycerol distearate
RL: TEM (Technical or engineered material use); USES (Uses)
(Caprol 6G2S; coating compns. having anti-**reflective** and anti-fogging properties useful for disposable surgical **masks** and face shields)

IT 31566-31-1, Glycerol monostearate
RL: TEM (Technical or engineered material use); USES (Uses)
(Cerasynt GMS; coating compns. having anti-**reflective** and anti-fogging properties useful for disposable surgical **masks** and face shields)

IT 120-40-1, Lauric diethanolamide
RL: TEM (Technical or engineered material use); USES (Uses)
(Chemstat LD 100; coating compns. having anti-**reflective** and anti-fogging properties useful for disposable surgical **masks** and face shields)

IT 93-82-3, Lipamide S 142-18-7, Luaricidin 1338-43-8, Span 80 2687-94-7, Surfadone LP-100 7631-86-9, Silica, uses 25038-59-9, PET polymer, uses 51569-39-2, Surfactant 10G 156410-05-8, Montanov 68 159940-10-0, Glucopon 625CS
RL: TEM (Technical or engineered material use); USES (Uses)
(coating compns. having anti-**reflective** and anti-fogging properties useful for disposable surgical **masks** and face shields)

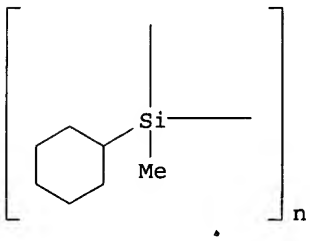
IT **2530-83-8**, A 187
RL: MOA (Modifier or additive use); USES (Uses)
(coupler; coating compns. having anti-**reflective** and anti-fogging properties useful for disposable surgical **masks** and face shields)

L30 ANSWER 21 OF 24 HCAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 1997:75315 HCAPLUS
DOCUMENT NUMBER: 126:218422
TITLE: Photon-stimulated ion desorption measurement of organosilicon resist reactions in extreme ultraviolet **lithography**
AUTHOR(S): Ogawa, Taro; Yamaguchi, Atsuko; Yamanashi, Hiromasa; Ito, Masaaki; Tachibana, Hiroaki;

Matsumoto, Mutsuyoshi; Sekitani, Tetsuji; Tanaka, Kenichiro
CORPORATE SOURCE: Central Research Laboratory, Hitachi Ltd., Kokubunji, 185, Japan
SOURCE: Japanese Journal of Applied Physics, Part 1: Regular Papers, Short Notes & Review Papers (**1996**), 35(12B), 6487-6490
CODEN: JAPNDE; ISSN: 0021-4922
PUBLISHER: Japanese Journal of Applied Physics
DOCUMENT TYPE: Journal
LANGUAGE: English

AB In extreme UV (EUV) **lithog.**, a surface-imaging process using an organosilicon resist is essential. Since the binding energies of Si core-level electrons coincide with the photon energy of the light source of EUV-**lithog.**, we have analyzed the effect of their excitation on the decompn. of an organosilicon resist. We have also investigated a design policy for optical systems in terms of selecting the multilayer mirror materials to use organosilicon resists in EUV **lithog.** A photon-stimulated ion desorption (PSID) anal. of poly(cyclohexylmethylsilane) (PCHMS) that was exposed to monochromatic synchrotron radiation was carried out. We found that decompn. of the Si-Si backbone of PCHMS is enhanced by EUV exposure to wavelengths that excite the Si 2p and 2s electrons. In addn., the yield of CH3+ desorbed from the side-chain Me of PCHMS is increased at a photon energy of 108 eV (a 11.5-nm wavelength), which presumably excites Si 2p electrons into the Si-C σ* state. Calcd. **reflectivities** of a multilayer mirror suggest that the **reflectivity** of a multilayer mirror which does not contain Si, such as Mo/Be, realizes excellent **reflectivity** at the wavelength that excites the Si 2p electron.

IT **88003-16-1**, Poly(cyclohexylmethylsilane)
RL: RCT (Reactant); TEM (Technical or engineered material use); RACT (Reactant or reagent); USES (Uses)
(photon-stimulated ion desorption measurement of organosilicon resist reactions in extreme UV **lithog.**)
RN 88003-16-1 HCAPLUS
CN Poly(cyclohexylmethylsilylene) (9CI) (CA INDEX NAME)



CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)
IT Energy level excitation
Optical reflection
(multilayer mirror for organosilicon resists for extreme-UV **lithog.**)
IT Desorption
(photodesorption; multilayer mirror for organosilicon resists for extreme-UV **lithog.**)
IT Mass spectra
Photoresists
Surface photolysis
(photon-stimulated ion desorption measurement of organosilicon resist reactions in extreme UV **lithog.**)
IT 7439-98-7, Molybdenum, uses 7440-21-3, Silicon, uses 7440-41-7,

Beryllium, uses
RL: DEV (Device component use); USES (Uses)
(multilayer mirror for organosilicon resists for extreme-UV **lithog.**)

IT 14531-53-4, Methyl(1+)
RL: FMU (Formation, unclassified); PEP (Physical, engineering or chemical process); FORM (Formation, nonpreparative); PROC (Process)
(photon-stimulated ion desorption measurement of organosilicon resist reactions in extreme UV **lithog.**)

IT **88003-16-1**, Poly(cyclohexylmethylsilane)
RL: RCT (Reactant); TEM (Technical or engineered material use); RACT (Reactant or reagent); USES (Uses)
(photon-stimulated ion desorption measurement of organosilicon resist reactions in extreme UV **lithog.**)

L30 ANSWER 22 OF 24 HCAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 1996:501457 HCAPLUS
DOCUMENT NUMBER: 125:144606
TITLE: Coating composition having both anti-**reflective** and anti-fogging properties
INVENTOR(S): Scholz, Mathew T.; Tiers, George V. D.
PATENT ASSIGNEE(S): Minnesota Mining and Manufacturing Co., USA
SOURCE: PCT Int. Appl., 65 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 9618918	A1	19960620	WO 1995-US15653	199511 30
W: AL, AM, AT, AU, BB, BG, BR, BY, CA, CH, CN, CZ, DE, DK, EE, ES, FI, GB, GE, HU, IS, JP, KE, KG, KP, KR, KZ, LK, LR, LS, LT, LU, LV, MD, MG, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, TJ				
RW: KE, LS, MW, SD, SZ, UG, AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG				
US 5585186	A	19961217	US 1994-354343	199412 12
CA 2205355	AA	19960620	CA 1995-2205355	199511 30
AU 9643724	A1	19960703	AU 1996-43724	199511 30
EP 797782	A1	19971001	EP 1995-942526	199511 30
EP 797782	B1	20020911		
R: DE, ES, FR, GB, IT				
ZA 9510377	A	19970606	ZA 1995-10377	199512 06
US 5723175	A	19980303	US 1996-684527	

					199607 19 <--
US 6040053	A	20000321	US 1998-33323		199803 02 <--
PRIORITY APPLN. INFO.:			US 1994-354343	A	199412 12 <--
			WO 1995-US15653	W	199511 30 <--
			US 1996-684527	A1	199607 19 <--

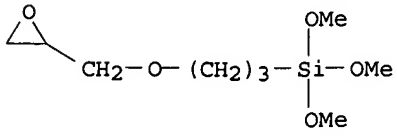
OTHER SOURCE(S): MARPAT 125:144606

AB A coating compn. which imparts both anti-**reflective** and anti-fogging properties to substrates coated therewith comprises (1) a porous inorg. metal oxide and (2) a silane or siloxane oligomer contg. ≥1 hydrophilic anionic group selected from OSO3-, SO3-, CO2-, PO4-, PO3-, PO42-, PO32-, or PO22-. The coating compns., when coated on ≥1 side of a light transmissive substrate and dried, exhibit a drop diam. .gtorsim.4 mm when tested with the wetting test and provide the substrate with a percent transmission at 550 nm which is ≥3% greater than that of the uncoated substrate. The coatings may be used in manuf. of disposable surgical **masks** and face shields, including eye shields. Thus, a coating compn. comprising Remasol SP-30 (silica) and di-Na 2-[3-(trihydroxysilyl)propylaminocarbonyl]benzenesulfonate was coated on a PET substrate and dried. The coated PET film was significantly more transparent and anti-**reflective** than the uncoated film. At sufficient concn. of the silane component, a durable anti-fogging/anti-**reflective** film sample was produced.

IT **2530-83-8**
RL: RCT (Reactant); RACT (Reactant or reagent)
(starting material; coating compns. based on inorg. oxides and silanes or siloxanes having both good anti-**reflective** and anti-fogging properties)

RN 2530-83-8 HCAPLUS

CN Silane, trimethoxy[3-(oxiranylmethoxy)propyl]- (9CI) (CA INDEX NAME)



IC ICM G02B001-10
ICS C03C017-30; C09D183-06; C09D183-08; C09D004-00

CC 38-3 (Plastics Fabrication and Uses)
Section cross-reference(s): 42, 46, 63

ST **antireflective** antifogging coating compn; silane contg **antireflective** antifogging coating compn; siloxane contg **antireflective** antifogging coating compn; inorg oxide silane coating compn

IT Safety devices
(eye shields; coating compns. based on inorg. oxides and silanes or siloxanes having both good anti-**reflective** and

anti-fogging properties)
IT Siloxanes and Silicones, uses
RL: PRP (Properties); SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(oligomeric; coating compns. based on inorg. oxides and silanes or siloxanes having both good anti-**reflective** and anti-fogging properties)
IT Surfactants
RL: PRP (Properties); SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(anionic, silyl-contg. anti-fogging agents; coating compns. based on inorg. oxides and silanes or siloxanes having both good anti-**reflective** and anti-fogging properties)
IT Optical materials
(**antireflective** films, anti-fogging; coating compns. based on inorg. oxides and silanes or siloxanes having both good anti-**reflective** and anti-fogging properties)
IT Antifogging agents
(coatings, coating compns. based on inorg. oxides and silanes or siloxanes having both good anti-**reflective** and anti-fogging properties)
IT Medical goods
(face **masks**, coating compns. based on inorg. oxides and silanes or siloxanes having both good anti-**reflective** and anti-fogging properties)
IT Safety devices
(**masks**, coating compns. based on inorg. oxides and silanes or siloxanes having both good anti-**reflective** and anti-fogging properties)
IT 7631-86-9, Silica, uses 107991-59-3, Remasol SP 30
RL: PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(anti-**reflective** material; coating compns. based on inorg. oxides and silanes or siloxanes having both good anti-**reflective** and anti-fogging properties)
IT 70869-39-5P 179862-64-7P 179862-65-8P 179862-66-9P 179862-67-0P
RL: PRP (Properties); SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(antifogging agent; coating compns. based on inorg. oxides and silanes or siloxanes having both good anti-**reflective** and anti-fogging properties)
IT 78-08-0, Triethoxyvinylsilane 81-08-3, o-Sulfobenzoic acid cyclic anhydride 107-97-1, Sarcosine **2530-83-8** 13822-56-5, 3-Aminopropyltrimethoxysilane
RL: RCT (Reactant); RACT (Reactant or reagent)
(starting material; coating compns. based on inorg. oxides and silanes or siloxanes having both good anti-**reflective** and anti-fogging properties)
IT 25038-59-9, Poly(ethylene terephthalate), properties
RL: MSC (Miscellaneous); PRP (Properties)
(substrate; coating compns. based on inorg. oxides and silanes or siloxanes having both good anti-**reflective** and anti-fogging properties)

L30 ANSWER 23 OF 24 HCAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 1994:617664 HCAPLUS
DOCUMENT NUMBER: 121:217664
TITLE: **Antireflective** coating materials added in chemically enhanced photoresist materials for **photolithography**
PATENT ASSIGNEE(S): International Business Machines Corp., USA
SOURCE: Jpn. Kokai Tokkyo Koho, 6 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese

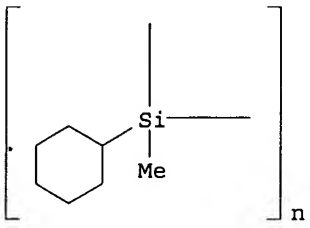
FAMILY ACC. NUM. COUNT: 2
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 06084789	A2	19940325	JP 1993-65 <--	19930104
US 5380621	A	19950110	US 1993-55400 <--	19930503
PRIORITY APPLN. INFO.:			US 1992-845404 A <--	19920303

AB Title material is polysilane, polyvinyl arom. compd., or their copolymer having properties with highly absorptive to mid- to deep-UV and practically chem.-inactive to its photoresist developing material. The antireflection coating materials give the **photolithog.** an improved precision.

IT **88003-16-1**, Poly(cyclohexylmethylsilane)
RL: MOA (Modifier or additive use); NUU (Other use, unclassified); POF (Polymer in formulation); USES (Uses)
(**antireflective** coating materials added in chem. enhanced photoresist materials for **photolithog.**)

RN 88003-16-1 HCAPLUS
CN Poly(cyclohexylmethylsilylene) (9CI) (CA INDEX NAME)



IC ICM H01L021-027
ICS G03F007-11

CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)
Section cross-reference(s): 38, 76

ST antireflection coating material photoresist **photolithog** resoln; polysilane antireflection coating material photoresist **photolithog**; polyvinyl arom compd antireflection coating material

IT Polysilanes
RL: MOA (Modifier or additive use); NUU (Other use, unclassified); POF (Polymer in formulation); USES (Uses)
(**antireflective** coating materials added in chem. enhanced photoresist materials for **photolithog.**)

IT Optical materials
(**antireflective**, **antireflective** coating materials added in chem. enhanced photoresist materials for **photolithog.**)

IT Resists
(photo-, **antireflective** coating materials added in chem. enhanced photoresist materials for **photolithog.**)

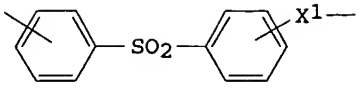
IT 25036-01-5, Poly(acenaphthylene) 28406-56-6, Poly(2-vinylnaphthalene) 30025-55-9 **88003-16-1**,

Poly(cyclohexylmethylsilane) 99635-06-0 100111-20-4
158169-09-6 158169-11-0
RL: MOA (Modifier or additive use); NUU (Other use, unclassified);
POF (Polymer in formulation); USES (Uses)
(**antireflective** coating materials added in chem.
enhanced photoresist materials for **photolithog.**)

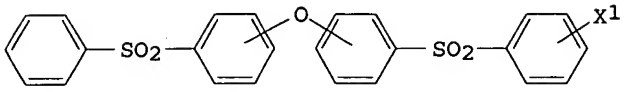
L30 ANSWER 24 OF 24 HCAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 1994:178163 HCAPLUS
DOCUMENT NUMBER: 120:178163
TITLE: Polymers with intrinsic light-absorbing properties for anti-**reflective** coating applications in deep ultraviolet **microlithography**
INVENTOR(S): Flaim, Tony; Lamb, Iii James; Moeckli, Kimberly A.; Brewer, Terry
PATENT ASSIGNEE(S): Brewer Science, Inc., USA
SOURCE: U.S., 11 pp.
CODEN: USXXAM
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 5234990	A	19930810	US 1992-835715	19920212 <--
WO 9419396	A1	19940901	WO 1993-US1849	19930218 <--
W: DE, GB, JP, KR, NL				
RW: AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE				
US 5368989	A	19941129	US 1993-55916	19930430 <--
US 5578676	A	19961126	US 1993-55793	19930430 <--
PRIORITY APPLN. INFO.:			US 1992-835715	19920212 <--

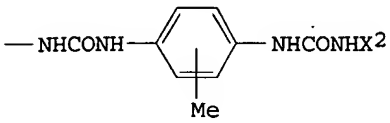
GI



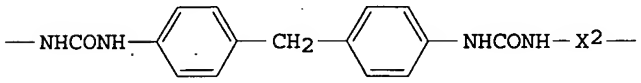
I



II



III



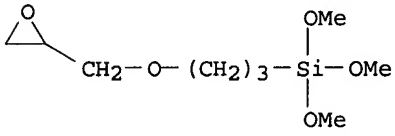
IV

AB The title polymers have a functional repeat unit selected from I-IV (X1, X2 = a divalent arom. group). Compns. comprising the polymers dissolved in a solvent are applied to substrates to form anti-**reflective** coatings and photoresists are subsequently applied thereon.

IT **2530-83-8**, (3-Glycidoxypropyl)trimethoxysilane
RL: USES (Uses)
(anti-**reflective** coatings contg. arom. polysulfones or polyureas and, for deep-UV **microlithog.**)

RN 2530-83-8 HCAPLUS

CN Silane, trimethoxy[3-(oxiranylmethoxy)propyl]- (9CI) (CA INDEX NAME)



IC ICM C08J003-00
ICS C08K005-36; C08L081-00

INCL 524609000

CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)

ST **antireflective** coating polysulfone UV **microlithog** ; polyurea **antireflective** coating UV **microlithog**

IT **Lithography**
(deep-UV, micro-, polysulfone and polyurea anti-**reflective** coatings for)

IT Polysulfones, uses
Polyureas
RL: USES (Uses)
(arom., anti-**reflective** coatings from, for deep-UV **microlithog.**)

IT 90-94-8 91-44-1, 7-Diethylamino-4-methylcoumarin 458-37-7, Curcumin 919-30-2, 3-Aminopropyltriethoxysilane **2530-83-8**, (3-Glycidoxypropyl)trimethoxysilane
RL: USES (Uses)
(anti-**reflective** coatings contg. arom. polysulfones or polyureas and, for deep-UV **microlithog.**)

IT 25135-51-7 53745-79-2
RL: USES (Uses)

(anti-**reflective** coatings from, for deep-UV **microlithog.**)

IT 80-73-9, 1,3-Dimethyl-2-imidazolidinone 96-48-0, γ-Butyrolactone 97-64-3, Ethyllactate 97-99-4, Tetrahydrofurfuryl alcohol 98-86-2, Acetophenone, uses 100-66-3, Anisole, uses 108-94-1, Cyclohexanone, uses 109-86-4, Ethyleneglycolmonomethylether 110-49-6, Ethylene glycol monomethyl ether acetate 111-96-6, 2-Methoxyethyl ether 120-92-3, Cyclopentanone 127-19-5, N,N-Dimethylacetamide 632-22-4, 1,1,3,3-Tetramethylurea 872-50-4, N-Methylpyrrolidone, uses 1320-67-8, Propyleneglycolmonomethylether 84540-57-8, Propyleneglycolmonomethylether acetate
RL: USES (Uses)
(liq. compns. contg. arom. polysulfones or polyureas and, for forming anti-**reflective** coatings for deep-UV **microlithog.**)

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